FINAL INITIAL STUDY

WELLHEAD TREATMENT SYSTEM PROJECT
WEST VALLEY WATER DISTRICT
SAN BERNARDINO COUNTY, CALIFORNIA

Prepared for:

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LSA Project No. WVW0901

LSA

August 28, 2009

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APPENDIX A

AIR QUALITY EMISSION CALCULATIONS
(Contained on enclosed CD-ROM)

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\datwater\Application Data\Urbemis\Version9a\Projects\West Valley WD.urb924

Project Name: West Valley WD

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2009 TOTALS (lbs/day unmitigated)	3.22	26.52	14.10	0.00	10.01	1.34	11.34	2.09	1.23	3.32	2,371.75
2009 TOTALS (lbs/day mitigated)	3.22	26.52	14.10	0.00	1.10	1.34	2.44	0.23	1.23	1.46	2,371.75
2010 TOTALS (lbs/day unmitigated)	23.69	9.47	6.41	0.00	0.01	0.59	0.60	0.00	0.54	0.55	1,103.60
2010 TOTALS (lbs/day mitigated)	21.32	9.47	6.41	0.00	0.01	0.59	0.60	0.00	0.54	0.55	1,103.60

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	0.13	0.14	0.12	0.00	0.00	0.00	168.00
TOTALS (lbs/day, mitigated)	0.12	0.14	0.12	0.00	0.00	0.00	168.00
Percent Reduction	7.69	0.00	0.00	#######	############	############	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	0.26	0.17	1.49	0.00	0.25	0.05	151.04

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2

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TOTALS (lbs/day, unmitigated)	0.39	0.31	1.61	0.00	0.25	0.05	319.04

Both Area and Operational Mitigation must be turned on to get a combined mitigated total.

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 4/24/2009-5/20/2009 Active Days: 19	3.22	**26.52**	**14.10**	0.00	**10.01**	**1.34**	**11.34**	**2.09**	**1.23**	**3.32**	**2,371.75**
Mass Grading 04/24/2009-05/20/2009	3.22	26.52	14.10	0.00	10.01	1.34	11.34	2.09	1.23	3.32	2,371.75
Mass Grading Dust	0.00	0.00	0.00	0.00	10.00	0.00	10.00	2.09	0.00	2.09	0.00
Mass Grading Off Road Diesel	3.18	26.46	12.98	0.00	0.00	1.33	1.33	0.00	1.23	1.23	2,247.32
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.04	0.07	1.13	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.43
Time Slice 5/25/2009-6/1/2009 Active Days: 6	3.22	**26.52**	**14.10**	0.00	**10.01**	**1.34**	**11.34**	**2.09**	**1.23**	**3.32**	**2,371.75**
Fine Grading 05/23/2009-06/01/2009	3.22	26.52	14.10	0.00	10.01	1.34	11.34	2.09	1.23	3.32	2,371.75
Fine Grading Dust	0.00	0.00	0.00	0.00	10.00	0.00	10.00	2.09	0.00	2.09	0.00
Fine Grading Off Road Diesel	3.18	26.46	12.98	0.00	0.00	1.33	1.33	0.00	1.23	1.23	2,247.32
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.04	0.07	1.13	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.43
Time Slice 6/4/2009-8/14/2009 Active Days: 52	2.22	18.96	9.45	0.00	0.01	0.93	0.94	0.00	0.86	0.86	1,839.07
Trenching 06/04/2009-08/15/2009	2.22	18.96	9.45	0.00	0.01	0.93	0.94	0.00	0.86	0.86	1,839.07
Trenching Off Road Diesel	2.18	18.90	8.32	0.00	0.00	0.93	0.93	0.00	0.86	0.86	1,714.64
Trenching Worker Trips	0.04	0.07	1.13	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.43
Time Slice 8/18/2009-8/28/2009 Active Days: 9	2.17	12.75	9.05	**0.00**	0.01	1.10	1.11	0.00	1.01	1.01	1,207.12
Asphalt 08/18/2009-08/28/2009	2.17	12.75	9.05	0.00	0.01	1.10	1.11	0.00	1.01	1.01	1,207.12
Paving Off-Gas	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.08	12.55	7.05	0.00	0.00	1.09	1.09	0.00	1.00	1.00	979.23
Paving On Road Diesel	0.01	0.08	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.14

Paving Worker Trips	0.06	0.12	1.97	0.00	0.01	0.01	0.02	0.00	0.00	0.01	217.75
Time Slice 9/1/2009-12/31/2009 Active Days: 88	1.37	10.13	6.65	0.00	0.01	0.65	0.66	0.00	0.60	0.60	1,103.64
Building 09/01/2009-01/24/2010	1.37	10.13	6.65	0.00	0.01	0.65	0.66	0.00	0.60	0.60	1,103.64
Building Off Road Diesel	1.30	9.79	4.94	0.00	0.00	0.63	0.63	0.00	0.58	0.58	893.39
Building Vendor Trips	0.02	0.25	0.20	0.00	0.00	0.01	0.01	0.00	0.01	0.01	43.02
Building Worker Trips	0.05	0.09	1.51	0.00	0.01	0.00	0.01	0.00	0.00	0.01	167.23
Time Slice 1/1/2010-1/22/2010 Active Days: 16	1.27	9.47	6.41	0.00	0.01	0.59	0.60	0.00	0.54	0.55	1,103.60
Building 09/01/2009-01/24/2010	1.27	9.47	6.41	0.00	0.01	0.59	0.60	0.00	0.54	0.55	1,103.60
Building Off Road Diesel	1.21	9.16	4.81	0.00	0.00	0.58	0.58	0.00	0.53	0.53	893.39
Building Vendor Trips	0.02	0.23	0.19	0.00	0.00	0.01	0.01	0.00	0.01	0.01	43.02
Building Worker Trips	0.04	0.08	1.41	0.00	0.01	0.00	0.01	0.00	0.00	0.01	167.19
Time Slice 1/27/2010-2/22/2010 Active Days: 19	**23.69**	0.02	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	34.37
Coating 01/27/2010-02/22/2010	23.69	0.02	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	34.37
Architectural Coating	23.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.01	0.02	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	34.37

Phase Assumptions

Phase: Fine Grading 5/23/2009 - 6/1/2009 - Default Fine Site Grading/Excavation Description

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 1

Fugitive Dust Level of Detail: Default

10 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 4/24/2009 - 5/20/2009 - Default Mass Site Grading/Excavation Description

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Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 1

Fugitive Dust Level of Detail: Default

10 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 6/4/2009 - 8/15/2009 - Default Trenching Description

Off-Road Equipment:

2 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Other General Industrial Equipment (238 hp) operating at a 0.51 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 0 hours per day

Phase: Paving 8/18/2009 - 8/28/2009 - Default Paving Description

Acres to be Paved: 0.06

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Phase: Building Construction 9/1/2009 - 1/24/2010 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

Phase: Architectural Coating 1/27/2010 - 2/22/2010 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 6/30/2008 specifies a VOC of 100

Rule: Residential Interior Coatings begins 7/1/2008 ends 12/31/2040 specifies a VOC of 50

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Rule: Residential Exterior Coatings begins 1/1/2005 ends 6/30/2008 specifies a VOC of 250

Rule: Residential Exterior Coatings begins 7/1/2008 ends 12/31/2040 specifies a VOC of 100

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 4/24/2009-5/20/2009 Active Days: 19	3.22	**26.52**	**14.10**	0.00	1.10	**1.34**	2.44	0.23	**1.23**	1.46	**2,371.75**
Mass Grading 04/24/2009-05/20/2009	3.22	26.52	14.10	0.00	1.10	1.34	2.44	0.23	1.23	1.46	2,371.75
Mass Grading Dust	0.00	0.00	0.00	0.00	1.10	0.00	1.10	0.23	0.00	0.23	0.00
Mass Grading Off Road Diesel	3.18	26.46	12.98	0.00	0.00	1.33	1.33	0.00	1.23	1.23	2,247.32
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.04	0.07	1.13	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.43
Time Slice 5/25/2009-6/1/2009 Active Days: 6	3.22	**26.52**	**14.10**	0.00	1.10	**1.34**	2.44	0.23	**1.23**	1.46	**2,371.75**
Fine Grading 05/23/2009-06/01/2009	3.22	26.52	14.10	0.00	1.10	1.34	2.44	0.23	1.23	1.46	2,371.75
Fine Grading Dust	0.00	0.00	0.00	0.00	1.10	0.00	1.10	0.23	0.00	0.23	0.00
Fine Grading Off Road Diesel	3.18	26.46	12.98	0.00	0.00	1.33	1.33	0.00	1.23	1.23	2,247.32
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.04	0.07	1.13	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.43
Time Slice 6/4/2009-8/14/2009 Active Days: 52	2.22	18.96	9.45	0.00	0.01	0.93	0.94	0.00	0.86	0.86	1,839.07
Trenching 06/04/2009-08/15/2009	2.22	18.96	9.45	0.00	0.01	0.93	0.94	0.00	0.86	0.86	1,839.07
Trenching Off Road Diesel	2.18	18.90	8.32	0.00	0.00	0.93	0.93	0.00	0.86	0.86	1,714.64
Trenching Worker Trips	0.04	0.07	1.13	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.43
Time Slice 8/18/2009-8/28/2009 Active Days: 9	2.17	12.75	9.05	**0.00**	0.01	1.10	1.11	0.00	1.01	1.01	1,207.12
Asphalt 08/18/2009-08/28/2009	2.17	12.75	9.05	0.00	0.01	1.10	1.11	0.00	1.01	1.01	1,207.12
Paving Off-Gas	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Paving Off Road Diesel	2.08	12.55	7.05	0.00	0.00	1.09	1.09	0.00	1.00	1.00	979.23
Paving On Road Diesel	0.01	0.08	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.14
Paving Worker Trips	0.06	0.12	1.97	0.00	0.01	0.01	0.02	0.00	0.00	0.01	217.75
Time Slice 9/1/2009-12/31/2009 Active Days: 88	1.37	10.13	6.65	0.00	0.01	0.65	0.66	0.00	0.60	0.60	1,103.64
Building 09/01/2009-01/24/2010	1.37	10.13	6.65	0.00	0.01	0.65	0.66	0.00	0.60	0.60	1,103.64
Building Off Road Diesel	1.30	9.79	4.94	0.00	0.00	0.63	0.63	0.00	0.58	0.58	893.39
Building Vendor Trips	0.02	0.25	0.20	0.00	0.00	0.01	0.01	0.00	0.01	0.01	43.02
Building Worker Trips	0.05	0.09	1.51	0.00	0.01	0.00	0.01	0.00	0.00	0.01	167.23
Time Slice 1/1/2010-1/22/2010 Active Days: 16	1.27	9.47	6.41	0.00	0.01	0.59	0.60	0.00	0.54	0.55	1,103.60
Building 09/01/2009-01/24/2010	1.27	9.47	6.41	0.00	0.01	0.59	0.60	0.00	0.54	0.55	1,103.60
Building Off Road Diesel	1.21	9.16	4.81	0.00	0.00	0.58	0.58	0.00	0.53	0.53	893.39
Building Vendor Trips	0.02	0.23	0.19	0.00	0.00	0.01	0.01	0.00	0.01	0.01	43.02
Building Worker Trips	0.04	0.08	1.41	0.00	0.01	0.00	0.01	0.00	0.00	0.01	167.19
Time Slice 1/27/2010-2/22/2010 Active Days: 19	21.32	0.02	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	34.37
Coating 01/27/2010-02/22/2010	21.32	0.02	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	34.37
Architectural Coating	21.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.01	0.02	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	34.37

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 5/23/2009 - 6/1/2009 - Default Fine Site Grading/Excavation Description

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

The following mitigation measures apply to Phase: Mass Grading 4/24/2009 - 5/20/2009 - Default Mass Site Grading/Excavation Description

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For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:
PM10: 84% PM25: 84%
For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:
PM10: 55% PM25: 55%
For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:
PM10: 44% PM25: 44%
For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:
PM10: 55% PM25: 55%
The following mitigation measures apply to Phase: Architectural Coating 1/27/2010 - 2/22/2010 - Default Architectural Coating Description
For Nonresidential Architectural Coating Measures, the Nonresidential Exterior: Use Low VOC Coatings mitigation reduces emissions by:
ROG: 10%
For Nonresidential Architectural Coating Measures, the Nonresidential Interior: Use Low VOC Coatings mitigation reduces emissions by:
ROG: 10%

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.01	0.14	0.12	0.00	0.00	0.00	168.00
Hearth							
Landscape							
Consumer Products							
Architectural Coatings	0.12						
TOTALS (lbs/day, unmitigated)	0.13	0.14	0.12	0.00	0.00	0.00	168.00

Area Source Mitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.01	0.14	0.12	0.00	0.00	0.00	168.00
Hearth							
Landscape							
Consumer Products							

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Architectural Coatings	0.11						
TOTALS (lbs/day, mitigated)	0.12	0.14	0.12	0.00	0.00	0.00	168.00

Area Source Mitigation Measures Selected

Mitigation Description	Percent Reduction
Industrial Increase Energy Efficiency Beyond Title 24	20.00
For Nonresidential Interior Use Low VOC Coating	10.00
For Nonresidential Exterior Use Low VOC Coating	10.00

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Utilities	0.26	0.17	1.49	0.00	0.25	0.05	151.04
TOTALS (lbs/day, unmitigated)	0.26	0.17	1.49	0.00	0.25	0.05	151.04

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2010 Temperature (F): 80 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Utilities		0.78	1000 sq ft	21.00	16.38	146.98
					16.38	146.98

Vehicle Fleet Mix

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Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	51.7	1.2	98.6	0.2
Light Truck < 3750 lbs	7.3	2.7	94.6	2.7
Light Truck 3751-5750 lbs	22.9	0.4	99.6	0.0
Med Truck 5751-8500 lbs	10.6	0.9	99.1	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.6	0.0	81.2	18.8
Lite-Heavy Truck 10,001-14,000 lbs	0.5	0.0	60.0	40.0
Med-Heavy Truck 14,001-33,000 lbs	0.9	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	0.5	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.8	67.9	32.1	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.9	0.0	88.9	11.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	13.3	7.4	8.9
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Utilities				2.0	1.0	97.0

Operational Changes to Defaults

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Urbemis 2007 Version 9.2.4

Combined Winter Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\datwater\Application Data\Urbemis\Version9a\Projects\West Valley WD.urb924

Project Name: West Valley WD

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2009 TOTALS (lbs/day unmitigated)	3.22	26.52	14.10	0.00	10.01	1.34	11.34	2.09	1.23	3.32	2,371.75
2009 TOTALS (lbs/day mitigated)	3.22	26.52	14.10	0.00	1.10	1.34	2.44	0.23	1.23	1.46	2,371.75
2010 TOTALS (lbs/day unmitigated)	23.69	9.47	6.41	0.00	0.01	0.59	0.60	0.00	0.54	0.55	1,103.60
2010 TOTALS (lbs/day mitigated)	21.32	9.47	6.41	0.00	0.01	0.59	0.60	0.00	0.54	0.55	1,103.60

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	0.13	0.14	0.12	0.00	0.00	0.00	168.00
TOTALS (lbs/day, mitigated)	0.12	0.14	0.12	0.00	0.00	0.00	168.00
Percent Reduction	7.69	0.00	0.00	#######	############	############	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	0.20	0.20	1.44	0.00	0.25	0.05	136.77

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2

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TOTALS (lbs/day, unmitigated)	0.33	0.34	1.56	0.00	0.25	0.05	304.77

Both Area and Operational Mitigation must be turned on to get a combined mitigated total.

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 4/24/2009-5/20/2009 Active Days: 19	3.22	**26.52**	**14.10**	0.00	**10.01**	**1.34**	**11.34**	**2.09**	**1.23**	**3.32**	**2,371.75**
Mass Grading 04/24/2009-05/20/2009	3.22	26.52	14.10	0.00	10.01	1.34	11.34	2.09	1.23	3.32	2,371.75
Mass Grading Dust	0.00	0.00	0.00	0.00	10.00	0.00	10.00	2.09	0.00	2.09	0.00
Mass Grading Off Road Diesel	3.18	26.46	12.98	0.00	0.00	1.33	1.33	0.00	1.23	1.23	2,247.32
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.04	0.07	1.13	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.43
Time Slice 5/25/2009-6/1/2009 Active Days: 6	3.22	**26.52**	**14.10**	0.00	**10.01**	**1.34**	**11.34**	**2.09**	**1.23**	**3.32**	**2,371.75**
Fine Grading 05/23/2009-06/01/2009	3.22	26.52	14.10	0.00	10.01	1.34	11.34	2.09	1.23	3.32	2,371.75
Fine Grading Dust	0.00	0.00	0.00	0.00	10.00	0.00	10.00	2.09	0.00	2.09	0.00
Fine Grading Off Road Diesel	3.18	26.46	12.98	0.00	0.00	1.33	1.33	0.00	1.23	1.23	2,247.32
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.04	0.07	1.13	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.43
Time Slice 6/4/2009-8/14/2009 Active Days: 52	2.22	18.96	9.45	0.00	0.01	0.93	0.94	0.00	0.86	0.86	1,839.07
Trenching 06/04/2009-08/15/2009	2.22	18.96	9.45	0.00	0.01	0.93	0.94	0.00	0.86	0.86	1,839.07
Trenching Off Road Diesel	2.18	18.90	8.32	0.00	0.00	0.93	0.93	0.00	0.86	0.86	1,714.64
Trenching Worker Trips	0.04	0.07	1.13	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.43
Time Slice 8/18/2009-8/28/2009 Active Days: 9	2.17	12.75	9.05	**0.00**	0.01	1.10	1.11	0.00	1.01	1.01	1,207.12
Asphalt 08/18/2009-08/28/2009	2.17	12.75	9.05	0.00	0.01	1.10	1.11	0.00	1.01	1.01	1,207.12
Paving Off-Gas	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.08	12.55	7.05	0.00	0.00	1.09	1.09	0.00	1.00	1.00	979.23
Paving On Road Diesel	0.01	0.08	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.14

Paving Worker Trips	0.06	0.12	1.97	0.00	0.01	0.01	0.02	0.00	0.00	0.01	217.75
Time Slice 9/1/2009-12/31/2009 Active Days: 88	1.37	10.13	6.65	0.00	0.01	0.65	0.66	0.00	0.60	0.60	1,103.64
Building 09/01/2009-01/24/2010	1.37	10.13	6.65	0.00	0.01	0.65	0.66	0.00	0.60	0.60	1,103.64
Building Off Road Diesel	1.30	9.79	4.94	0.00	0.00	0.63	0.63	0.00	0.58	0.58	893.39
Building Vendor Trips	0.02	0.25	0.20	0.00	0.00	0.01	0.01	0.00	0.01	0.01	43.02
Building Worker Trips	0.05	0.09	1.51	0.00	0.01	0.00	0.01	0.00	0.00	0.01	167.23
Time Slice 1/1/2010-1/22/2010 Active Days: 16	1.27	9.47	6.41	0.00	0.01	0.59	0.60	0.00	0.54	0.55	1,103.60
Building 09/01/2009-01/24/2010	1.27	9.47	6.41	0.00	0.01	0.59	0.60	0.00	0.54	0.55	1,103.60
Building Off Road Diesel	1.21	9.16	4.81	0.00	0.00	0.58	0.58	0.00	0.53	0.53	893.39
Building Vendor Trips	0.02	0.23	0.19	0.00	0.00	0.01	0.01	0.00	0.01	0.01	43.02
Building Worker Trips	0.04	0.08	1.41	0.00	0.01	0.00	0.01	0.00	0.00	0.01	167.19
Time Slice 1/27/2010-2/22/2010 Active Days: 19	**23.69**	0.02	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	34.37
Coating 01/27/2010-02/22/2010	23.69	0.02	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	34.37
Architectural Coating	23.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.01	0.02	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	34.37

Phase Assumptions

Phase: Fine Grading 5/23/2009 - 6/1/2009 - Default Fine Site Grading/Excavation Description

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 1

Fugitive Dust Level of Detail: Default

10 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 4/24/2009 - 5/20/2009 - Default Mass Site Grading/Excavation Description

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Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 1

Fugitive Dust Level of Detail: Default

10 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 6/4/2009 - 8/15/2009 - Default Trenching Description

Off-Road Equipment:

2 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Other General Industrial Equipment (238 hp) operating at a 0.51 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 0 hours per day

Phase: Paving 8/18/2009 - 8/28/2009 - Default Paving Description

Acres to be Paved: 0.06

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Phase: Building Construction 9/1/2009 - 1/24/2010 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

Phase: Architectural Coating 1/27/2010 - 2/22/2010 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 6/30/2008 specifies a VOC of 100

Rule: Residential Interior Coatings begins 7/1/2008 ends 12/31/2040 specifies a VOC of 50

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Rule: Residential Exterior Coatings begins 1/1/2005 ends 6/30/2008 specifies a VOC of 250

Rule: Residential Exterior Coatings begins 7/1/2008 ends 12/31/2040 specifies a VOC of 100

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Winter Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 4/24/2009-5/20/2009 Active Days: 19	3.22	**26.52**	**14.10**	0.00	1.10	**1.34**	2.44	0.23	**1.23**	1.46	**2,371.75**
Mass Grading 04/24/2009-05/20/2009	3.22	26.52	14.10	0.00	1.10	1.34	2.44	0.23	1.23	1.46	2,371.75
Mass Grading Dust	0.00	0.00	0.00	0.00	1.10	0.00	1.10	0.23	0.00	0.23	0.00
Mass Grading Off Road Diesel	3.18	26.46	12.98	0.00	0.00	1.33	1.33	0.00	1.23	1.23	2,247.32
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.04	0.07	1.13	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.43
Time Slice 5/25/2009-6/1/2009 Active Days: 6	3.22	**26.52**	**14.10**	0.00	1.10	**1.34**	2.44	0.23	**1.23**	1.46	**2,371.75**
Fine Grading 05/23/2009-06/01/2009	3.22	26.52	14.10	0.00	1.10	1.34	2.44	0.23	1.23	1.46	2,371.75
Fine Grading Dust	0.00	0.00	0.00	0.00	1.10	0.00	1.10	0.23	0.00	0.23	0.00
Fine Grading Off Road Diesel	3.18	26.46	12.98	0.00	0.00	1.33	1.33	0.00	1.23	1.23	2,247.32
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.04	0.07	1.13	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.43
Time Slice 6/4/2009-8/14/2009 Active Days: 52	2.22	18.96	9.45	0.00	0.01	0.93	0.94	0.00	0.86	0.86	1,839.07
Trenching 06/04/2009-08/15/2009	2.22	18.96	9.45	0.00	0.01	0.93	0.94	0.00	0.86	0.86	1,839.07
Trenching Off Road Diesel	2.18	18.90	8.32	0.00	0.00	0.93	0.93	0.00	0.86	0.86	1,714.64
Trenching Worker Trips	0.04	0.07	1.13	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.43
Time Slice 8/18/2009-8/28/2009 Active Days: 9	2.17	12.75	9.05	**0.00**	0.01	1.10	1.11	0.00	1.01	1.01	1,207.12
Asphalt 08/18/2009-08/28/2009	2.17	12.75	9.05	0.00	0.01	1.10	1.11	0.00	1.01	1.01	1,207.12
Paving Off-Gas	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Paving Off Road Diesel	2.08	12.55	7.05	0.00	0.00	1.09	1.09	0.00	1.00	1.00	979.23
Paving On Road Diesel	0.01	0.08	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.14
Paving Worker Trips	0.06	0.12	1.97	0.00	0.01	0.01	0.02	0.00	0.00	0.01	217.75
Time Slice 9/1/2009-12/31/2009 Active Days: 88	1.37	10.13	6.65	0.00	0.01	0.65	0.66	0.00	0.60	0.60	1,103.64
Building 09/01/2009-01/24/2010	1.37	10.13	6.65	0.00	0.01	0.65	0.66	0.00	0.60	0.60	1,103.64
Building Off Road Diesel	1.30	9.79	4.94	0.00	0.00	0.63	0.63	0.00	0.58	0.58	893.39
Building Vendor Trips	0.02	0.25	0.20	0.00	0.00	0.01	0.01	0.00	0.01	0.01	43.02
Building Worker Trips	0.05	0.09	1.51	0.00	0.01	0.00	0.01	0.00	0.00	0.01	167.23
Time Slice 1/1/2010-1/22/2010 Active Days: 16	1.27	9.47	6.41	0.00	0.01	0.59	0.60	0.00	0.54	0.55	1,103.60
Building 09/01/2009-01/24/2010	1.27	9.47	6.41	0.00	0.01	0.59	0.60	0.00	0.54	0.55	1,103.60
Building Off Road Diesel	1.21	9.16	4.81	0.00	0.00	0.58	0.58	0.00	0.53	0.53	893.39
Building Vendor Trips	0.02	0.23	0.19	0.00	0.00	0.01	0.01	0.00	0.01	0.01	43.02
Building Worker Trips	0.04	0.08	1.41	0.00	0.01	0.00	0.01	0.00	0.00	0.01	167.19
Time Slice 1/27/2010-2/22/2010 Active Days: 19	21.32	0.02	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	34.37
Coating 01/27/2010-02/22/2010	21.32	0.02	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	34.37
Architectural Coating	21.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.01	0.02	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	34.37

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 5/23/2009 - 6/1/2009 - Default Fine Site Grading/Excavation Description

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

The following mitigation measures apply to Phase: Mass Grading 4/24/2009 - 5/20/2009 - Default Mass Site Grading/Excavation Description

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For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:
PM10: 84% PM25: 84%
For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:
PM10: 55% PM25: 55%
For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:
PM10: 44% PM25: 44%
For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:
PM10: 55% PM25: 55%
The following mitigation measures apply to Phase: Architectural Coating 1/27/2010 - 2/22/2010 - Default Architectural Coating Description
For Nonresidential Architectural Coating Measures, the Nonresidential Exterior: Use Low VOC Coatings mitigation reduces emissions by:
ROG: 10%
For Nonresidential Architectural Coating Measures, the Nonresidential Interior: Use Low VOC Coatings mitigation reduces emissions by:
ROG: 10%

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.01	0.14	0.12	0.00	0.00	0.00	168.00
Hearth							
Landscape							
Consumer Products							
Architectural Coatings	0.12						
TOTALS (lbs/day, unmitigated)	0.13	0.14	0.12	0.00	0.00	0.00	168.00

Area Source Mitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Winter Pounds Per Day, Mitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.01	0.14	0.12	0.00	0.00	0.00	168.00
Hearth							
Landscape							
Consumer Products							

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Architectural Coatings	0.11						
TOTALS (lbs/day, mitigated)	0.12	0.14	0.12	0.00	0.00	0.00	168.00

Area Source Mitigation Measures Selected

Mitigation Description	Percent Reduction
Industrial Increase Energy Efficiency Beyond Title 24	20.00
For Nonresidential Interior Use Low VOC Coating	10.00
For Nonresidential Exterior Use Low VOC Coating	10.00

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Utilities	0.20	0.20	1.44	0.00	0.25	0.05	136.77
TOTALS (lbs/day, unmitigated)	0.20	0.20	1.44	0.00	0.25	0.05	136.77

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2010 Temperature (F): 60 Season: Winter

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Utilities		0.78	1000 sq ft	21.00	16.38	146.98
					16.38	146.98

Vehicle Fleet Mix

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Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	51.7	1.2	98.6	0.2
Light Truck < 3750 lbs	7.3	2.7	94.6	2.7
Light Truck 3751-5750 lbs	22.9	0.4	99.6	0.0
Med Truck 5751-8500 lbs	10.6	0.9	99.1	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.6	0.0	81.2	18.8
Lite-Heavy Truck 10,001-14,000 lbs	0.5	0.0	60.0	40.0
Med-Heavy Truck 14,001-33,000 lbs	0.9	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	0.5	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.8	67.9	32.1	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.9	0.0	88.9	11.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	13.3	7.4	8.9
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Utilities				2.0	1.0	97.0

Operational Changes to Defaults

Preliminary Cost Estimate for the Pipelines of FBR Treatment Plant
Construction Costs

		LF	Cost	Total
Water	8" Service	190	$60	$11,400
	6" Double Detector Check			$10,000
				$21,400
Electrical				**$30,000**
Sewer	8" Sewer	1100	$120	$132,000
	Manholes	10	$5,000	$50,000
	Connections	2	$10,000	$20,000
				$202,000
Paving	w/ base	18300	sqft	$100,000
	Concrete	1200	$10	$12,000
	AC Berm	400	$20	$8,000
				$120,000
Retaining Wall	8' High	100	$200	$20,000
	Backfill	100	$50	$5,000
				$25,000
Drains	12" Drain	300	$50	$15,000
	Catch Basin	3	$2,000	$6,000
				$21,000
Install 16" Waterlines				**$670,480**
Flood Control	Rip Rap			$5,000
	Land			
Fence		200	$15	$3,000
Remove	Concrete Slab			
	Retaining Wall			
	Block Pipe Supports			**$20,000**
Remove	16" Waterline	280	$50	**$14,000**
Relocate	Gas			$50,000
	Diesel			$50,000
				$100,000
Regrading	Remove	200	$10	$2,000
	Recompact	200	$20	$4,000
	Pavement	200		$5,000
				$11,000
			Subtotal	**$1,242,880**
			15% Contingency	$186,432
			Total	$1,429,312
			Submitted Price	**$1,500,000**

WEST VALLEY WATER DISTRICT

MATERIAL LIST
and
BID SCHEDULE

PROJECT: WATER TREATMENT PLANT

QUANTITY LIST FOR JOB 62026.184 - Water Treatment Plant

DESCRIPTION						
Sheet	4	5	6	7	Total	Unit
Furnish and Install 16" Waterline	780	800	675	665	2920	LF
Furnish and Install 16" Butterfly Valve	6	1	6	1	14	EA
Furnish and Install 16"-90º Elbow	3	6	7	0	16	EA
Furnish and Install 16"-45º Elbow	2	2	3	4	11	EA
Furnish and Install 16" - Flex Coupling	1	2	1	0	4	EA
Furnish and Install 16" x 12" Reducer	0	0	0	1	1	EA
Furnish and Install 16" Cross	0	0	1	0	1	EA
Furnish and Install 16" Tee	4	1	3	0	8	EA
Connect to Existing 16" Waterline	1	1	5	2	9	EA
Furnish and Install 16" Bld Flg	1	0	0	0	1	EA
Furnish and Install 16"x4' Spool Piece	1	2	6	0	9	EA
Furnish and Install 16" - Flex Connector	1	2	6	0	9	EA
Furnish and Install 16" Wye	0	0	0	1	1	EA
					0	EA
					0	EA
Furnish and Install Sand Bedding	780	800	675	665	2920	LF
Furnish and Install Base Pavement	300	230	50	665	1245	LF
Furnish and Install CL 2 Base	300	230	50	665	1245	LF
Furnish and Install Cap Pavement	1200	920	200	2660	4980	SF
Furnish and Install Thrust Blocks	0	0	0	0	1	LS
					0	EA
					0	EA
Pipeline Flush, Test, Disinfect					1	EA
Provide Traffic Control					1	EA
Provide Bonds and Insurance					1	EA
Provide Shoring	300	300	0	700	1300	LF
SWPPP					1	EA
Striping						LS
						LS
						LS
						LS

ERSC #62026-184

Item	Qty.		DESCRIPTION		
1	2920	LF	Furnish and Install 16" Waterline	$110	$321,200
2	14	EA	Furnish and Install 16" Butterfly Valve	$4,000	$56,000
3	16	EA	Furnish and Install 16"-90º Elbow	$2,000	$32,000
4	11	EA	Furnish and Install 16"-45º Elbow	$1,500	$16,500
5	4	EA	Furnish and Install 16" - Flex Coupling	$900	$3,600
6	1	EA	Furnish and Install 16" x 12" Reducer	$1,000	$1,000
7	1	EA	Furnish and Install 16" Cross	$2,000	$2,000
8	8	EA	Furnish and Install 16" Tee	$1,800	$14,400
9	9	LS	Connect to Existing 16" Waterline	$9,000	$81,000
10	1	EA	Furnish and Install 16" Bld Flg	$500	$500
11	9	EA	Furnish and Install 16"x4' Spool Piece	$1,000	$9,000
12	9	LS	Furnish and Install 16" - Flex Connector	$900	$8,100
13	1	LS	Furnish and Install 16" Wye	$1,900	$1,900
14	0	LS		$1	$0
15	0	LS		$1	$0
	2920	LF	Furnish and Install Sand Bedding	$1.00	$2,920
	1245	LF	Furnish and Install Base Pavement	$22	$27,390
	1245	LF	Furnish and Install Class II Base	$18	$22,410
	4980	SF	Furnish and Install Cap Pavement	$2	$9,960
	1	LS	Furnish and Install Thrust Blocks	$10,000	$10,000
	1	LS	Pipeline Flush, Test, Disinfect	$6,000	$6,000
	1	LS	Provide Traffic Control	$5,000	$5,000
	1	LS	Provide Bonds and Insurance	$36,000	$36,000
	1300	LF	Provide Shoring	$2	$2,600
	1	LS	SWPPP	$1,000	$1,000
	0	LS	Striping	$3,000	$0
				Total	$670,480

West Valley Water District

FBR - Cost Estimate: Operation
Kennedy/Jenks Consultants
19-Aug-2009

Electrical

Capacity	2000	gpm	
Design Flow	1600	gpm	
System Uptime - % Operation	80%		Calculated as Design Flow / Capacity

Electrical Costs $ 0.10 per kW-H

Motors / Pumps / Equipment	HP	% Op		Annual Electrical Costs	Notes
Well #6 Groundwater Pump	350	40%	80%	$73,162	2510 gpm kW-H
Well #11 Groundwater Pump	200	79%	80%	$82,569	1267 gpm kW-H
Total Well Production Electrical Costs				**$155,731**	
P-110 Fluidization Pump #1	25	100%	95%	$15,514	155,143
P-120 Fluidization Pump #2	25	100%	95%	$15,514	155,143
P-220 Filter Feed Pump	40	100%	80%	$20,903	209,035
B-200A Aeration Air Blower	10	100%	80%	$5,226	52,259
B-200B Aeration Air Blower	10	100%	80%	$5,226	52,259
B-300A Filter Air Blower	25	5%	80%	$653	6,532
B-300B Filter Air Blower	25	5%	80%	$653	6,532
P-400 Filter Backwash Pump	150	5%	80%	$3,919	39,194
P-405 Treated Water Pump	75	100%	80%	$39,194	391,940
P-410 Backwash Recycle Pump	7.5	5%	80%	$196	1,960
P-415 Backwash Mixing Pump	20	100%	80%	$10,452	104,517
D-410 Dissolved Air Flotation System					
Chain Top Skimmer					
Auger					
P-420 DAF Circulation Pump	20	100%	80%	$10,452	104,517
P-430 Recovered Water Pump	5	5%	80%	$131	1,306
P-450 Drywell Sump Pump	0.75	5%	80%	$20	196
P-450B Drywell Sump Pump	0.75	5%	80%	$20	196
P-640 Analyzer Recycle Pump	0.75	5%	80%	$20	196
C-1010 Air Compressor	15	50%	80%	$3,919	39,194
C-1020 Air Compressor	15	50%	80%	$3,919	39,194
Total	**469.75**	**HP**		**$291,662**	**/yr**

Sources:
Motor HPs from Electrial Equipment List Spreadsheet supplied by Basin Water 7/2/09
Operational Frequency from Todd Webster (Basin Water) telephone conversation 7/2/09
Electrical Costs from West Valley Water District 7/2/09

West Valley Water District

855 W. Base Line Road
Rialto, California 92377

Attachment 1
Proposition 84 Section 75025
Supplemental Information Form

Wellhead Treatment System Project

Project No. 3610004-801

January 2010

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PROPOSITION 84, SECTION 75025
SUPPLEMENTAL INFORMATION FORM

I. SYSTEM INFORMATION

1. Public Water System Name / Entity Name: **West Valley Water District**

2. Public Water System ID Number: **3610004**

3. Project Title: **Wellhead Treatment System Project**

Please note that all figures referenced herein are provided at the end of this document, within Appendix A.

II. ELIGIBILITY CRITERIA

1. In order to be eligible for Section 75025 funding, the project must meet all of the following conditions:

a. The project will prevent or reduce the contamination of groundwater.

b. The project is "Ready to Proceed". ("Ready to Proceed" is defined as completed plans and specifications, completed environmental documentation, and completed hydrogeologic investigation (if needed).)

c. The project will protect public health and will address a contaminant with a Primary MCL.

d. The affected groundwater provides at least one-third of a community's drinking water supply. (Based on data indicating historical, current, or potential supply.)

e. Project must address anthropogenic source of contamination. ("Anthropogenic" is defined as caused by humans.

	Yes	No
a. Does the project prevent or reduce the contamination of groundwater? If yes, please explain: *Please see answer 2A, below.*	☒	☐
b. Is the project considered "Ready to Proceed"? If yes, explain how the project is "Ready to Proceed": *Please see answer 2B, below.*	☒	☐
c. Does the project protect public health and will address a contaminant with a primary MCL? If yes, please explain: *Please see answer 2C, below.*	☒	☐
d. Does the affected groundwater provide at least one-third of a community's drinking water supply? (Based on historical, current, or potential supply data.) If yes, please provide data to support this response: *Please see answer 2D, below.*	☒	☐
e. Does the project address an anthropogenic source of contamination? If yes, please identify the contaminants and the source of the contamination: *Please see answer 2E, below.*	☒	☐

2A) Does the project prevent or reduce the contamination of groundwater? If yes, please explain:

Yes, the project prevents and reduces the contamination of groundwater.

The project involves construction and operation of a groundwater wellhead treatment system to remove perchlorate, nitrate and volatile organic compounds (VOCs), including trichloroethylene (TCE) from groundwater coming from two Public Water System (PWS) drinking water production wells, Rialto Well No. 6 and West Valley Water District (District) Well No. 11. The wellhead treatment system will implement biological treatment using a treatment train consisting of a fluidized bed biological reactor (FBR), dual media filtration, re-aeration, chlorine disinfection, with a contingency for granular activated carbon (GAC) and finally, delivery to the potable supply. The locations of these contaminant plumes in proximity to the PWS well sources are presented in Figures 1-1A and 1-1B.

The Rialto Well No. 6 site represents a location in the Rialto-Colton Groundwater Basin where elevated maximum concentrations of perchlorate (up to 320 micrograms per liter [µg/l]) and TCE (up to 6.3 µg/l) have been detected. The maximum contaminant levels (MCLs) in drinking water are 6 and 5 µg/l, respectively, as listed in Title 22 of the California Code of Regulations (CCR). Increasing perchlorate detections caused the City to inactivate Rialto Well No. 6 for drinking water supply in December 2001. Because of the rising perchlorate concentrations in Rialto Well No. 6 and other wells, Rialto declared a water supply emergency in November 2007 and has since worked with the District in this and other efforts to stabilize and recover local water supplies.

A hydrograph demonstrating the increase in concentration of TCE and perchlorate levels at Rialto Well No. 6 over the last 20 years is presented in Figure 1-2. Although District Well No. 11 is currently detecting perchlorate concentrations around the MCL, it has not operated significantly since 2002. It is anticipated and expected that when District Well No. 11 begins pumping again, perchlorate concentrations will increase quickly, and VOCs may be detected.

The project would prevent and reduce the contamination of groundwater for the following reasons:

1) The project will reduce the contamination of groundwater by extracting contaminated groundwater, destroying contaminants and putting the treated groundwater to its most beneficial use as potable drinking water.
2) The project will help prevent further migration of contaminants downgradient by capturing contamination near the highest concentration portion of the plume and by removing contaminant mass using the FBR process.
3) By removing mass, the project will potentially eliminate the duration and cost for treatment for these contaminants at PWS wells downgradient of the project's location.

The source(s) of contamination are still uncontrolled, but are being investigated by the U.S. Environmental Protection Agency (USEPA), the Santa Ana Regional Water Quality Control Board (RWQCB) and the California Department of Toxic Substances Control (DTSC). This effort represents the first large-scale step towards preventing further contamination of groundwater.

2B) Is the project considered "Ready to Proceed"? If yes, explain how the project is "Ready to Proceed":

Yes, the project is ready to proceed.

The project has completed 100% design plans and specifications, has prepared an implementation schedule, and estimated construction and Operations and Maintenance costs. A Final Initial Study/ Mitigated Negative Declaration was prepared pursuant to the California Environmental Quality Act (CEQA) and was adopted by the District's Board of Directors on September 3, 2009, and a Notice of Determination was filed and posted with the San Bernardino County Clerk of the Board and State Clearinghouse on September 8, 2009, along with the required California Department of Fish and Game filing fee. These documents are described in the Application for Funding, and are included within the overall grant application as Attachment 2, Final Design Plans and Specifications, Attachment 3, Project Environmental Documentation, and within Attachment 4, Project Technical Report. The project is ready to bid, and can commence construction immediately upon receipt of necessary funding.

The Wellhead Treatment System Project is supported by the Santa Ana RWQCB and USEPA. Consequently, there is more than sufficient information and studies available between the project location and the source area(s) to define the extent of contamination for the purposes of this project. As appropriate, those studies and data have been included within this application. No hydrogeologic investigation is necessary to provide additional support or documentation of the identified groundwater contamination problem and proposed project action.

2C) Does the project protect public health and will address a contaminant with a primary MCL? If yes, please explain:

Yes, the project will address perchlorate, TCE, and nitrate, which are the three contaminants impacting the two PWS wells and that are over their respective primary MCLs. The MCLs for perchlorate, TCE, and nitrate are 6 µg/L, 5 µg/L, and 45 mg/L, respectively, as listed in Title 22 of the CCR.

The project will protect public health by: 1) treating the perchlorate, TCE and nitrate contaminated groundwater to below the MCLs in order to provide safe and reliable drinking water; 2) reducing the overall contamination of groundwater in the Rialto-Colton Groundwater Basin, and 3) preventing further migration and impact to other downgradient PWS well sources.

In Rialto Well No. 6, concentrations of perchlorate have been detected as high as 320 µg/L (CDPH, 2009) and for TCE, as high as 6.3 µg/L (Clinical Laboratories of San Bernardino, 2009A). Both contaminants are over their respective MCLs, particularly as seen with perchlorate, which is more than 10 times the established limit. Nitrate levels have been detected at 13 mg/L (Clinical Laboratories of San Bernardino, 2009B).

In District Well No. 11, concentrations of nitrate have been detected above the MCL in water samples collected in June 1999 (52.2 mg/l) and August 1999 (48.7 mg/l) (West San Bernardino County Water District, 2002), prompting its removal from service. District Well No. 11 was formally inactivated with the CDPH in March 2001 (West San Bernardino County Water District, 2001). Most recent samples taken 15 December 2009 show the greatest concentrations to date at 54 mg/L (Test America, 2009). A sample taken in July 2005 detected perchlorate exceeding the MCL at 6.5 at µg/L (CDPH, 2009). Although District Well No. 11 is currently detecting perchlorate concentrations around the MCL, it has not operated significantly since 2002. It is

anticipated and expected that when District Well No. 11 begins pumping again, perchlorate concentrations will increase quickly, and VOCs may be detected. Recent samplings for TCE have shown concentrations at District Well No. 11 at the MCL, at 5 µg/L (Test America, 2009).

Using the recent maximum concentrations of contaminants at the wells, and a range of operating conditions for the ratio of flow rates from the two wells, rough approximate annual removal rates of contaminants have been estimated. It is estimated that the project is anticipated to remove the following mass of contaminants from groundwater annually:

- Between 300 to 2,500 pounds of perchlorate;
- Between 10 and 50 pounds of TCE; and,
- Between 100,000 to 300,000 pounds of nitrate (quantified as NO_3).

The following describes how these contaminants can adversely affect human health, and provides further support for why implementation of the project would protect public health.

Perchlorate Impact on Human Health

In 2008 the Deputy Director for Scientific Affairs of the Office Environmental Health Hazard Assessment (OEHHA) stated in testimony before the U.S. Senate (OEHHA, 2008) that:

> *"Our health concern is this: Perchlorate inhibits the uptake of iodide, an essential nutrient, by the thyroid gland. Inadequate iodide uptake disrupts proper thyroid function. Thyroid hormones, such thyroxine (T4) and triiodothoronine (T3), help regulate the growth and maturation of tissues, particularly the brain. Disruption of these hormones due to iodine deficiency can lead to impaired growth and development in fetuses. Several epidemiological studies indicate that iodine deficiency during pregnancy may affect brain development and may cause intellectual deficits in children."*

Perchlorate as studied by OEHHA (OEHHA, 2004) in developing a public health goal (PHG) was found to have developmental affects primarily in sensitive populations. As stated by OEHHA: "One of the more serious human health effects observed in scientific studies is perchlorate's disruption of thyroid hormone production." Also, "Pregnant women and their developing fetuses may suffer the most serious health effects from perchlorate contamination in drinking water, particularly in the first and second trimesters of pregnancy. During this period, the fetal thyroid is not yet fully functional, so the mother's thyroid must be able to produce enough extra T4 hormone to enable her baby's brain to develop properly."

TCE Impact on Human Health

In 2008 the Deputy Director for Scientific Affairs of OEHHA stated in testimony before the U.S. Senate (OEHHA, 2008) that:

> *"Over the past 20 years, California has consistently treated TCE as a carcinogen in our air, water, and other programs. In April 1988, California listed trichloroethylene as a "chemical known to the state to cause cancer" (under the California Safe Drinking Water and Toxic Enforcement Act of 1986, also known as Proposition 65). In 1990, we developed a "no significant risk" level to help businesses determine when Californians must receive Proposition 65 warnings concerning exposure to TCE. Also that year, we reviewed trichloroethylene for our air toxics program and again concluded that it should be considered*

a carcinogen for purposes of public health protection. TCE was listed as a toxic air contaminant based on the carcinogenic effects."

In the 2009 PHG for TCE (OEHHA, 2009), OEHHA considered TCE as a human carcinogen. It is acutely toxic at moderate to low concentrations.

Nitrate Impact on Human Health

Nitrate as studied by OEHHA (OEHHA, 1997) had a PHG calculated, "based on the protection of infants from the occurrence of methemoglobinemia," the principal toxic effect observed in humans exposed to nitrate or nitrite.

2D) Does the affected groundwater provide at least one-third of a community's drinking water supply? (Based on historical, current, or potential supply data.) If yes, please provide data to support this response:

Yes, the affected groundwater provides at least one-third of a community's drinking water supply as explained below.

The contaminated groundwater affects the majority of the Rialto-Colton Basin and portions of the North-Riverside and Eastern-Chino Basins. The groundwater coming from the two PWS wells, Rialto Well No. 6 and District Well No. 11, owned and operated by the City and District respectively, are a major source of supply for the City and its more than 90,000 residents. The City and District's service areas combined serve almost all of the City of Rialto (see Figure 1-5). As a result of the groundwater affecting these two PWS wells, more than one-third of the affected drinking water supplies have been impacted (even without considering reduced operation of other wells in the Rialto-Colton Basin in 2004 due to contamination). The total groundwater production impacted by the contamination at these two wells is estimated at 36.5%.

The presence of perchlorate has reduced the District's annual production capacity from the Rialto-Colton Basin from more than 6,300 acre-feet per year (AF/Yr) to 3,067 AF/Yr (WVWD, 2006), a 51% reduction, per the District's 2005 Urban Water Management Plan (UWMP). For the City of Rialto, the presence of perchlorate has reduced annual production capacity from more than 4,300 AF/Yr to 2,800 AF/Yr (Rialto, 2006), a 35% reduction, per the City's 2005 UWMP. Within the Rialto-Colton Basin, lost capacity due to the presence of contamination is approximately one-half (50%) of the Basin's total capacity.

The District supplies drinking water from PWS wells drawing from five different groundwater basins, surface water from Lytle Creek and the State Water Project (SWP) (WVWD, 2006). In 2004, the mix of water supplied was 69% groundwater, 20% surface water and 11% purchased water (WVWD, 2006). The contamination affects groundwater in three of the five basins used for supply, thereby affecting approximately 60% of the groundwater, and 40% of the total District's supply portfolio. Similar to that mentioned above for the City of Rialto, the District's UWMP states: "The Rialto Groundwater Basin has perchlorate contamination problems that severely limit current production and is used mainly for standby purposes only." If the perchlorate contamination had not been present, groundwater from impacted basins would represent more than 40% of the District's normal uncontaminated supply.

The City similarly supplies drinking water from PWS wells drawing from five different groundwater basins, surface water from Lytle Creek and the SWP purchased from the San

Bernardino Valley Municipal Water District (Rialto, 2006). In 2004, the mix of water supplied was 67% groundwater, 7% surface water and 26% purchased water (Rialto, 2006). The contamination affects groundwater in three of the five basins used for supply, thereby affecting 43% of the groundwater, and 28% of the total City of Rialto supply portfolio. This estimation of supply makeup in 2004 does not consider that five out of the six City PWS wells in the Rialto-Colton Basin were listed in the 2005 UWMP as not being in use due to perchlorate contamination. If the perchlorate contamination had not been present, groundwater from impacted basins would represent more than 33% of the City's normal uncontaminated supply.

2E) Does the project address an anthropogenic source of contamination? If yes, please identify the contaminants and the source of the contamination:

Yes, the Wellhead Treatment System Project addresses perchlorate, nitrate, and VOCs, specifically TCE, impacting Rialto Well No. 6 and District Well No. 11. These contaminants originated from anthropogenic ('caused by humans') sources.

The majority of the perchlorate contamination in the Rialto-Colton Basin is believed to be attributable to both historical disposal practices associated with the former Rialto Backup Ammunition Storage Point, and more recent activities at and near the County of San Bernardino's Mid-Valley Sanitary Landfill (a property referred to as the 160-acre parcel) and other subsequent overlying uses in the northern portion of the Basin. The general locations of the near-source existing perchlorate contamination and the locations of Rialto Well No. 6 and District Well No. 11 are illustrated on Figure 1-3. The full lateral and vertical extent of perchlorate in groundwater in the Basin is presently not known.

As identified on Figure 1-3, two primary geographic source areas within the contaminated area are currently being investigated under the direction of the Santa Ana RWQCB, USEPA, and the DTSC. These two areas consist of:

- A 160-acre parcel bounded by West Casa Grande Drive on the north, Locust Avenue on the east, the extension of Alder Avenue on the west, and the extension of Summit Avenue on the south (including a former DTSC-regulated facility called the Broco Site); and
- Property owned by the County of San Bernardino, including, but not limited to, future, currently active, and former landfill facilities and the Robertson's Ready Mix aggregate processing facility operating on County land, and one parcel directly south of the County's landfill expansion area.

The source of nitrate contamination in groundwater in the Basin is not fully understood; however, past agricultural activities are believed to be one probable source. The full lateral and vertical extent of nitrates in groundwater in the Basin is presently not known.

VOCs including TCE have been detected in groundwater in the Basin since 1988. TCE and other VOCs to a lesser extent are chemicals of concern (COC) in the Basin along with perchlorate and nitrate. The near-source extent of TCE contamination in the Basin is believed to be similar to perchlorate near the source areas, but not extending as far downgradient, with similar suspected sources and source areas (see Figure 1-1B). The full lateral and vertical extent of VOCs including TCE in groundwater in the Basin is presently not known.

The 160-acre parcel, which has recently been listed as a Superfund Site, is the primary source of contamination addressed by the Wellhead Treatment System Project (Figures 1-1A and

1-1B). The contaminants from the 160-acre parcel being addressed by the project are perchlorate and VOCs, including specifically TCE.

PLEASE NOTE: If you answered "NO" to any of the above questions, your project does not meet the Proposition 84 Section 75025 Eligibility Criteria.

2. Will the proposed project replace existing facilities?

No, the project will not replace existing facilities. The planned components of the proposed project include: minor well modifications at Rialto Well No. 6 and District Well No. 11; modification of existing and new pipelines within Etiwanda, Willow, and Cactus Avenues, a new connection to District Well No. 33 for system hydraulic testing/makeup and blending water, as needed, depending on influent concentrations from Rialto Well No. 6 and District Well No. 11; a new wellhead treatment plant at the District's maintenance yard, and a new discharge system to either the Cactus flood control basin (during the demonstration period as required by the CDPH) or District Reservoir 3A-1 or 3A-2 located at the District's headquarters site.

If yes, please respond to the following questions. If no, proceed to Eligibility Criteria #3.

Projects to replace existing treatment facilities are eligible if one or more of the following conditions are met:

Not Applicable.

	Yes	No
a. Does the existing treatment capacity need to be increased? (subject to the noted sizing criteria)	☐	☐
b. Is the existing treatment facility nearing or at the end of its useful life?	☐	☐
c. Will the replacement of an existing treatment facility reduce operation and maintenance costs for that facility?	☐	☐
d. Will the replacement of an existing treatment facility increase contaminant removal efficiency through improved technology?	☐	☐

If you answered "Yes" to any of the above questions, please explain your answer:

III. RANKING CRITERIA

As appropriate please attach supporting documentation to your application to just your response.

1. a) Identify the contaminant(s) of concern, and indicate with an "X" what its impact is on the PWS source:

The proposed Wellhead Treatment System Project focuses on the removal of perchlorate, TCE, and nitrate from two PWS groundwater drinking water production wells located in the Rialto-Colton Basin: District Well No. 11 and Rialto Well No. 6. See Figures 1-1A and 1-1B for the locations of these contaminant plumes in proximity to the two PWS wells.

District Well No. 11 & Rialto Well No. 6	***Impact on Drinking Water Source***			
Contaminant	**Contaminant has reached PWS source and has been detected > MCL**	**Contaminant has reached PWS source and has been detected < MCL**	**Contaminant has not reached PWS source but is within 2 year TOT**	**Contaminant has not reached PWS source but is within 2-10 TOT**
Perchlorate	District Well No. 11 & Rialto Well No. 6			
TCE	Rialto Well No. 6	District Well No. 11		
Nitrate	District Well No. 11	Rialto Well No. 6		

The MCLs for perchlorate, TCE, and nitrate are 6 µg/L, 5 µg/L, and 45 mg/L, respectively, as listed in Title 22 of the CCR.

For perchlorate, both PWS wells have detected levels above the MCL with Rialto Well No. 6 detecting particularly high concentrations at 320 µg/L (CDPH, 2009), and District Well No. 11 detecting maximum levels at 6.5 at µg/L (CDPH, 2009). Although District Well No. 11 is currently detecting perchlorate concentrations around the MCL, it has not operated significantly since 2002. It is anticipated and expected that when District Well No. 11 begins pumping again, perchlorate concentrations will increase quickly, and VOCs may be detected.

For TCE, Rialto Well No. 6 has detected the contaminant at a maximum of 6.3 µg/L (Clinical Laboratories of San Bernardino, 2009A), which is above the MCL. For District Well No. 11, recent samplings have shown TCE concentrations at the MCL, at 5 µg/L (Test America, 2009).

For nitrate, samplings from Rialto Well No. 6 show detected levels at 13 mg/L (Clinical Laboratories of San Bernardino, 2009B), which is less than the MCL. In District Well No. 11, concentrations of nitrate have been detected above the MCL in water samples collected in June 1999 (52.2 mg/l) and August 1999 (48.7 mg/l) (West San Bernardino County Water District, 2002), prompting its removal from service. The well was formally inactivated with the CDPH in March 2001 (West San Bernardino County Water District, 2001). Most recent samples taken on 15 December 2009 show the greatest concentrations to date at 54 mg/L (Test America, 2009), well above the MCL.

b) Please provide the treatment process(es) and/or other methods to address the above contaminant(s):

The project consists of the construction and operation of a groundwater wellhead treatment system to remove the perchlorate, nitrate and TCE from the groundwater impacting District Well No. 11 and Rialto Well No. 6.

The wellhead treatment system will use a multiple unit process treatment-train based on FBR technology to treat the perchlorate and nitrate. The anticipated blended influent TCE concentration from Rialto Well No. 6 and District Well No. 11 is expected to be less than the MCL; however, there is a contingency to add GAC, or other treatment, if TCE concentrations exceed the treatment capacity of the designed treatment system.

The FBR is one of two perchlorate treatment technologies listed as a "Best Available Control Technology" by the CDPH (CDPH, 2002). Since the 2002 conditional approval by CDPH, the FBR system has been used in multiple locations, including an extended pilot test at Rialto Well No. 2. This testing under CDPH oversight has shown the FBR to be effective for reducing both perchlorate and nitrates, and to a lesser level of documentation VOCs (Webster et al., 2009A and 2009B). As required by the conditional approval and subsequent direction by CDPH technical staff, dual media filtration, re-aeration, and chlorine disinfection will be used downstream of the FBR, to further treat the water.

Flexibility has been incorporated into the design of the treatment system and pipelines to enable potential expansion to treat up to 4,000 gpm should the project be modified in the future to assist in remediation of the Basin in cooperation with the Santa Ana RWQCB, USEPA, DTSC, and/or other agencies. The proposed project will also remove contaminants from groundwater in the Basin, resulting in mass removal and decreasing future contamination of downgradient PWS supply wells. At this time, the potential expansion of the treatment system is only speculative and is not part of the proposed project.

Upon successful completion of a required initial startup demonstration period overseen by the CDPH, approximately 2,000 gpm of treated groundwater from the proposed project will be used by District and the City for drinking water supply.

Final Plans and Specifications have been provided with this application (see Attachment 2) to provide a more detailed description of each project component. Local CDPH staff has been highly involved through the 100% design development for the Wellhead Treatment System Project. For example, local CDPH staff has participated in the 10, 50, and 90 percent design project meetings that included the District, City, design team, and other subconsultants involved in the detailed design of this project.

2. Provide the contaminant plume characteristics, and provide documents or data supporting this (Is the plume migrating towards a PWS source? Is the contaminant source being replenished? Is the contaminant plume stable?):

The perchlorate, nitrate, and TCE contaminant plumes impacting District Well No. 11 and Rialto Well No. 6 are shown on Figures 1-1A and1-1B.

In general, the contamination has resulted in exceedances of the perchlorate MCL at multiple wells in the Rialto-Colton Basin (RWQCB, 2004). The list of impacted wells in 2004 by the RWQCB is as follows:

WVWD	5 Wells	Representing Capacity of 8,819 gpm
Rialto	5 Wells	Representing Capacity of 12,552 gpm
Colton	3 Wells	Representing Capacity of 4,713 gpm
Fontana WC	7 Wells	Representing Capacity of 14,900 gpm
Total	20 Wells	Representing Capacity of 40,135 gpm

The source area for perchlorate and TCE addressed primarily by this project is the property referred to as the 160-acre site, and along the groundwater flow-path extending from the site. The full extent of contamination is still under investigation by the USEPA, Santa Ana RWQCB, and DTSC. A number of potentially responsible parties have been identified. The current investigation activities are located both on-site and off-site, and enough data exists to sufficiently understand the near-source distribution of groundwater contamination. Investigative activities discussed herein generally include activities performed directly by the USEPA and B.F. Goodrich (one of the potentially responsible parties). The results from the USEPA have been released in draft format, while the B.F. Goodrich studies have culminated in a remedial investigation report and subsequent sampling updates (Geosyntec, 2006). The City of Rialto and City of Colton have both performed independent interpretations of the data generated at the time of their evaluations (Rialto, 2007A and DPRA, 2008).

The 160-acre site has been named on the National Priorities List by the USEPA, as the Goodrich Site (USEPA, 2009A, 2009B and 2009C). There are multiple on-site sources of perchlorate and VOCs, including TCE, where recent data have shown extremely elevated levels of perchlorate contamination in soil within 20 feet of ground surface. Portions of the 160-acre site are still being used by a fireworks company, which has historically used perchlorate in its formulations. A DTSC listed site known as the Broco Site is also located within the downgradient portion of the 160-acre site.

Contaminant Plume Characteristics

The aerial plumes for perchlorate and TCE are shown in Figures 1-1A and 1-1B. In cross-section view, the plume has also been mapped by DPRA on behalf of the City of Colton as shown in Figure 1-4.

The contaminant concentrations at all individual PWS wells through time are not presented here, but do appear somewhat dependent on precipitation and subsequent recharge. However, the concentrations of perchlorate and TCE at Rialto Well No. 6 have been strongly increasing as demonstrated in Figure 1-2. This increase supports the need for the project and demonstrates that contaminant migration is still occurring. Although District Well No. 11 is currently detecting perchlorate concentrations around the MCL, it has not operated significantly since 2002. It is anticipated and expected that when District Well No. 11 begins pumping again, perchlorate concentrations will increase quickly, and VOCs may be detected.

Nitrate has been elevated above the MCL at selected wells in the Basin, most notably, at District Well No. 11. The exact source of nitrate is not known, however it is almost certainly related to the historical anthropogenic use of the area for agriculture.

Plume Migration Towards a PWS Source

The perchlorate, TCE, and nitrate plumes have already reached and contaminated numerous PWS well sources, and continue to migrate unabated. Only wellhead treatment to date has removed any contamination related to the 160-acre source area site.

Contaminant Source Replenishment

The contaminant sources remain uncontrolled, and thus, the sources of perchlorate and TCE to groundwater are being replenished with each substantive rain event. This condition will remain until source-area remediation is performed. The rainwater infiltrating to groundwater moves

through residual soil contamination and continues to leach to the groundwater. Elevated concentrations (>1,000 micrograms per kilogram) of perchlorate and VOCs was detected within 20 feet of ground surface at the 160-acre site of 190,000 micrograms per kilogram (RWQCB, 2008, Hescox Letter). In addition, the potential for new, additional releases of perchlorate and nitrate contamination exists, as fireworks manufacturing continues at the 160-acre source area site.

Contaminant Plume Stability

The perchlorate and TCE contaminant plumes in groundwater are not stable. The contaminant sources remain uncontrolled, perchlorate does not bio-degrade readily, and perchlorate and TCE trends in groundwater wells are increasing, thus suggesting that an increase in aerial extent of the plumes with time is occurring.

The nitrate contamination in groundwater is similarly not stable. The nitrate contamination is variable, and increases in contaminant levels at PWS well sources can be intermittent, and appear dependant on well pumpage, groundwater levels and gradients and/or seasonal rainfall.

3. **Is treatment or alternate supply necessary to meet maximum day demand for affected PWS? If yes, please explain:**

Given the large number of PWS wells impacted by perchlorate, TCE and nitrate, both the District and City have had to rely on both treatment and alternative supplies to meet maximum day demand. Specifically, the loss of District Well No. 11 and Rialto Well No. 6 for drinking water supply due to groundwater contamination has made it difficult for the District and City to maintain operational flexibility, and has reduced total local production capacity to meet seasonal peak water demands.

The average daily potable water demands for the District, as identified within their 2005 UWMP, are 20.3 mgd, or 22,734 AF/Yr. This includes domestic, commercial, bulk, hydrant meters, and unaccounted for water within the system. The estimated peak summer day demands are assumed to be twice the average day, or 40.6 mgd (WVWD, 2006).

The average daily demand within the City's service area, as identified within their 2005 UWMP, is 10.4 mgd, or 11,624 AF/Yr. Average water use in the City is approximately 103 gallons per capita per day. The peak summer day demand is estimated to be twice the average day or 20.8 mgd (Rialto, 2006).

To meet these peak demands, treatment and alternate supply sources have been sought, including: uncontaminated PWS wells in the Rialto-Colton Basin that would otherwise not be used, or would not have been used as heavily; contaminated PWS wells with treatment in the Rialto-Colton and other basins; PWS wells in other basins (e.g. the Chino, North-Riverside, Lytle-Creek and Bunker Hill Basins); and, surface water supplies (including imported water provided via the Baseline Feeder [including SWP Water] and Lytle Creek Treatment Facility). At this time, maximum day demand is being met by a combination of strategies, including providing water from alternative sources (e.g., pumping from PWS wells in lower/higher pressure zones, or further distances [in other basins] and using more surface water), and by treating groundwater from wells that have been impacted.

As a result of the groundwater contamination, the City of Rialto in 2007 declared a water supply emergency (Rialto, 2007B and 2007C).

4. What is the population served by PWS sources that are within the 10 year Time of Travel (TOT) for the contaminant(s)? (Provide a map showing the 10 year TOT):

It is estimated that the population served by PWS sources within the 10-year time of travel (TOT) is 100,914 people, as described below.

The perchlorate and TCE contamination in the Rialto-Colton Basin is extensive. Generally, the perchlorate contamination extends further than the TCE contamination and the nitrate contamination appears at select wells. For this estimate it is critical to note that no PWS well source is serving water over the MCL, and although PWS wells within service areas may be impacted, or may become impacted, treatment is being used to reduce concentrations to below the MCL.

The extent of perchlorate has been depicted by the City of Colton and is illustrated in Figure 1-1A.

The 10-year TOT for wells in the Rialto-Colton Basin has been estimated for the source water assessments performed in 2002 (WVWD, 2002 and Rialto, 2002). For District Well No. 11, the 10-year TOT was estimated at 2,113 feet. For Rialto Well No. 6, the 10-year TOT was estimated at 2,586 feet. For the purpose of estimating the population served by PWS sources that are within the 10 year TOT for the contaminants, this has been averaged at 2,350 feet.

Given the accounting and engineering details of how the District and Rialto supply water and serve customers, determining the exact population served by PWS well sources that are within the 10-year TOT for the contaminants is problematic; however, an estimate has been made using the plume distribution, travel time estimates, total population served and pressure-zones impacted by the contamination. Figure 1-5 illustrates the District's and Rialto's service area boundaries and pressure zones. Figure 1-6 shows the extent of perchlorate contamination, as estimated by the City of Colton (DPRA, 2008). Figure 1-7 illustrates the perchlorate extent and has added a buffer zone to indicate the average 10-year travel time. The plume area plus the 10-year TOT buffer-zone affects seven of the eight District pressure zones. The plume area plus the 10-year TOT buffer-zone covers almost all of the City's six pressure zones. Extrapolating using the total population served as indicated within the 2005 UWMPs, the population served by PWS sources within the 10-year TOT equates to approximately 100,914 people, as indicated in the table below. This calculation doesn't consider the assumed extrapolation of 5 to 10% growth, or approximately 10,000 connections added over the next 20 years within the City of Rialto.

TABLE 1-1 POPULATION SERVED WITHIN 10 YEAR TIME OF TRAVEL OF CONTAMINANT PLUME

PWS System	2004 Population Served	No. of Service Areas	No. of Service Areas Affected	% Affected	Estimated Population Served
Rialto	48,414	6	6	100	48,414
WVWD	60,000	8	7	87.5	52,500
Total	**108,414**	**14**	**13**	**N/A**	**100,914**

5. Will the local water supply reliability be enhanced if project is fully implemented? If yes, please explain:

Yes, local water supply reliability will be enhanced if the project is fully implemented. The reliability of a water supply refers to the ability to meet water demands on a consistent basis, even in times of drought or other constraints on source water availability. The Wellhead Treatment System Project will restore two local PWS sources that will help the District and City maintain adequate water supplies through drought periods or import supply reductions.

The District and the City currently meet approximately 22% to 26% of their respective demands with imported SWP water (WVWD, 2007; Rialto, 2006). However, the availability of SWP supply is variable. It fluctuates annually depending on precipitation, regulatory restrictions, legislative restrictions, and operational conditions, and is subject to severe curtailment during dry years. Of particular concern is the recent (2007) U.S. District Court ruling whereby the SWP was held in violation of the federal Endangered Species Act due to potential pumping impacts on populations of the Delta smelt, a fish species living in the Sacramento Delta, resulting in the order to curb water imports from the Delta by up to 35% from the SWP and the Central Valley Project. Further, in June 2008, Governor Arnold Schwarzenegger declared California to be in a statewide drought condition, and called for a reduction in statewide water uses by 20% by the year 2020. The District and City mainly meet the balance of their demands with local groundwater and a small amount of surface water.

Specifically, implementation of the project will enhance local water supply reliability because:

1) The subject groundwater wells are located close to, or within an existing drinking water supply distribution system, and even without treatment, present the lowest-cost, most reliable PWS sources of supply. The project will reduce the length of time needed for cleanup of contaminated groundwater. It is located in a prominent portion of the plume, thereby removing the need for treatment at wells located downgradient within the expected 10 year TOT. The project would also reduce reliance on alternative supply sources, such as imported SWP or local surface water, while improving overall reliability of an existing, local groundwater supply within the Rialto-Colton Basin.

2) Alternative supplies in the form of either direct surface water (e.g., Lytle Creek or SWP water), or groundwater from the Bunker Hill Basin, which requires a 100 percent SWP replenishment, are subject to seasonal availability and long transport distances, and is therefore less reliable than groundwater from the Rialto-Colton Basin. Development of alternative groundwater supplies outside of the Basin, yet within the District's or City's water rights, also require additional and extensive operations and maintenance costs (e.g., booster pump stations require higher electrical costs) to serve the affected population due to the distance from the customer, and could be subject to increased interruptions due to longer travel times.

6. Will the project increase opportunities for groundwater recharge and optimize groundwater supplies? If yes, please explain:

The Wellhead Treatment System Project will increase opportunities for groundwater recharge by restoring groundwater production capacity lost due to contamination, and allow for optimization of local groundwater supplies in the Rialto-Colton Basin to occur in a shorter timeframe by reclaiming operational flexibility.

Groundwater recharge for purposes of drinking water supply cannot occur in the Rialto-Colton Basin until the existing groundwater contamination has been controlled or significantly reduced, both of which are goals of this project. Significant studies and preliminary plans for groundwater recharge have been performed using the Cactus Basin(s) in the Rialto-Colton Basin, many of which were initiated prior to the discovery of the extensive groundwater contamination (USGS, 1997 and 2001). Additionally, the Upper Santa Ana River Watershed (USARW) Integrated Regional Water Management Plan (IRWMP) identified several related projects with the goal of facilitating recharge in the Cactus Basins (USARW, 2007). Implementation of the proposed project would contribute to overall management of the contamination for perchlorate, nitrate and TCE in an area adjacent to the Cactus Basins, would shorten the amount of time required to successfully clean the groundwater, and therefore would provide for more immediate opportunities for groundwater recharge following source control.

Due to the extensive contamination of PWS groundwater wells within the Rialto-Colton Basin, including numerous additional wells beyond those addressed by the project, the Basin can not be used for groundwater recharge and storage of surface water (and/or SWP) within the potential, available Cactus recharge basins. Further, treating the groundwater would free up surface water supply for other uses (e.g., water supply, recharge, trading, etc.). The Wellhead Treatment System Project will help restore use of a viable groundwater supply and reduce reliance on surface waters that then can be considered as sources of recharge.

In terms of the optimization of groundwater supplies, the presence of contamination has severely limited the flexibility that water purveyors had prior to the contamination, which was to pump groundwater wells based solely on head (pressure needs) and/or economic considerations. Currently, the decision for groundwater pumping must consider in part, minimizing the more costly use of contaminated wells that require treatment. This project will help shorten the time required for treatment of contaminated wells, and therefore facilitate the use of groundwater in the most optimal manner, without adversely affecting rate-payers due to increased cost of supply.

7. Will the project be implemented pursuant to a comprehensive basinwide groundwater quality management and remediation plan, or is it necessary to develop a comprehensive groundwater plan? If yes, please explain:

Development of a comprehensive groundwater plan for implementation of the Wellhead Treatment System Project is not required, as the project has already been identified as a component of the USARW IRWMP (USARW, 2007). (Within the IRWMP, the Wellhead Treatment System Project is titled “Remediation Extraction Wells to Capture High-Concentration Perchlorate Contamination in the Rialto-Colton Basin.”)

The USARW IRWMP was developed to meet the intent and requirements of Senate Bill 1938, Groundwater Management Planning Act of 2002. Senate Bill 1938 does not require local agencies to prepare a groundwater management plan for basins that are managed through adjudications. The basins in the USARW are adjudication “in gross.” The IRWMP states that the agencies in the region, however, decided to prepare the IRWMP because they support the intent of the law. The IRWMP states: “The preparation of certain basin management objectives will assist local agencies in optimizing local resources while protecting groundwater and surface water resources. The preparation of basins management objectives also will facilitate an understanding of the basin or subbasin, thereby allowing local agencies, individually and cooperatively, to meet local, regional, and state water needs through conjunctive management, while ensuring that no particular water supply is jeopardized.”

In addition, the four water purveyors in the Rialto-Colton Basin (the District, Rialto, City of Colton and the Fontana Water Company), and the County of San Bernardino developed a 5-year initial groundwater cleanup plan, (Water Purveyors, 2007) that addresses the project. This plan included a plume interception task that focused on contamination emanating from the 160-acre source area site, of which the Wellhead Treatment System Project represents a significant component.

The project is also supported by the USEPA (USEPA, 2008), the SWRCB, and the Santa Ana RWQCB (RWQCB, 2007A and 2009A and 2009B and SWRCB, 2009).

8. **Does the affected groundwater provide a local supply that, if contaminated, will require the importation of additional water from the Sacramento-San Joaquin Delta or the Colorado River? If yes, please explain:**

The inability to use the two PWS wells (Rialto Well No. 6 and District Well No. 11) for drinking water supply due to contamination has made it difficult for the District and Rialto to maintain operational flexibility and meet seasonal peak water demands. As a result, both water purveyors have had to rely more on imported SWP supply and local surface supplies to meet their customer demands.

Per Rialto's 2005 UWMP (Rialto, 2006), in 2004, the City received 26% of its water through the Baseline Feeder, where it was purchased on Rialto's behalf by the San Bernardino Valley Municipal Water District (SBVMWD) from the SWP. The City also received 7% from the Oliver P. Roemer Water Filtration Facility (treats water from Lytle Creek and the SWP).

Per the District's 2007 water update (WVWD, 2007), surface water either from Lytle Creek or the SWP made up 22% of water delivered to customers. Also, the District purchased 14% of the water delivered to its customers from the City of San Bernardino through the SBVMWD, which ultimately requires replenishment through SWP sources.

This increase in SWP demand will add a cumulative impact to the water supply of the Sacramento-San Joaquin Delta and may harm the water quality and ecosystem quality. Recent court rulings have already identified delta smelt and salmon as being impacted by the operations of the SWP. These rulings are indications that the Bay-Delta is already in critical danger from current activities and stresses that are placed on it would increase these impacts. The Wellhead Treatment System Project will reduce the reliance on water from the SWP to meet potable demands, thereby lowering current and future adverse impacts to the Bay-Delta.

9. **Does the project serve an economically disadvantaged community? (Area served has an MHI that is ≤ 80% of the Statewide MHI) If yes, please provide a water service area map for the affected area:**

Yes, the Wellhead Treatment System Project will benefit an economically disadvantaged community (DAC) (see Figure 1-8).

In order to provide the most accurate determination of the DACs in the project area, MHI was compared at the census tract level. Census tracts are relatively permanent geographic subdivisions of a county or equivalent entity used to document regional demographic trends. The analysis showed that several census tracts within the PWS service area(s) have an MHI less than 80 percent of the statewide MHI. A census-designated place (CDP) is an area

identified by the U.S. Census Bureau for statistical reporting that is treated as a city or municipality because it resembles them in population density and structure, but which has no separate town rights or a city council. The community of Bloomington is an unincorporated CDP in San Bernardino County, California. The District provides the majority of water supply to Bloomington. From the U.S. Census Bureau 2006-2008 American Community Survey 3-Year Estimates, the average MHI of California is $61,154 (U.S. Census, 2009A) while the Bloomington CDP has a MHI of $ 42,339 (U.S. Census, 2009B), which is less than 80% of the California MHI value of $48,923.20.

10. **Does the project have the potential to leverage funds? If "YES", please indicate the potential amount and source of the funds to be leveraged?:**

Yes, the Wellhead Treatment System Project will leverage at least $5.7 million in outside funding sources. This includes two funding sources that are already secured for this project.

The first funding source is the U.S. Department of Defense's Environmental Security Technology Certification Program (ESTCP). The ESTCP has committed more than $2.9 million towards a portion of the FBR treatment system for the Project, as well as associated CDPH permitting costs (ESTCP, 2007A and 2007B).

The second funding source totals approximately $2.8 million is from the SWRCB's Cleanup and Abatement Account (CAA) to be used for project design, permitting and O&M costs (RWQCB, 2009A, 2009B and SWRCB 2009).

A more detailed discussion of project funds is provided in Attachment 4, Project Technical Report, Section E.

11. **Does the project address the contamination at a site on the list maintained by the Department of Toxic Substances Control pursuant to Health & Safety Code Section 25356 or is the site listed on the federal CERCLA National Priorities List? If yes, please indicate which list it is on:**

Yes, the Wellhead Treatment System Project will address contamination originating from both federally and state listed sites. Specifically, the project will treat groundwater contamination emanating from a federal CERCLA National Priorities List (NPL) Superfund Listed Site (i.e., the B.F. Goodrich Site [EPA–HQ–SFUND–2008–0574], USEPA, 2009A, 2009B, and 2009C), as well as a DTSC listed site (the Broco Site, located at 2824 N. Locust Avenue, DTSC, [Envirostor ID: 60001069], DTSC 1990 and 2009), within the southeastern footprint of the NPL listed site.

IV. OTHER

1. **Projects may fall under the jurisdiction of other state or federal agencies and are subject those agencies' normal permit and approval processes. Will this project fall under the jurisdiction of another state or federal agency?** Please see complete answer below.

   If yes, please list all applicable agency or agencies: Please see complete answer below.

   If yes, have all applicable permits and approvals been obtained?: Please complete see answer below.

The Wellhead Treatment System Project will be subject to regulatory oversight and/or permit approvals by the following agencies: CDPH (for drinking water); the Santa Ana RWQCB (for discharge of drinking water-quality water to the Cactus Basin during the temporary demonstration period); the South Coast Air Quality Management District (SCAQMD) (for general construction/treatment plant operations); and local land use agencies with approval authority (including the District and City of Rialto). An Underground Utility Crossing permit will also be required by the San Bernardino County Flood Control District for installation of pipelines within a portion of their right-of-way.

The project will fall primarily under the jurisdiction of CDPH. The project will require a modification of the District's water supply permit and compliance with CDPH policy memo 97-005 (Policy Guidance for Direct Domestic Use of Extremely Impaired Sources). Initial steps of amending the drinking water permit under policy memo 97-005 have been completed under the guidance of the local CDPH District Engineer, and the District's water supply permit will be modified as needed as the project proceeds. The other permitting bodies are regional, and include the Santa Ana RWQCB and the SCAQMD.

As required by policy memo 97-005, a demonstration period is anticipated where the treated water can not be used as a water supply source. The District will be required to comply with the RWQCB's Waste Discharge Requirements, General Permit for this demonstration period when drinking water-quality water is discharged to the Cactus Basin. The District will have to submit a new application before any discharge to the Cactus Basin can commence. The RWQCB Order for this general permit is order R8-2007-0008 (RWQCB, 2007B), titled, "General Groundwater Cleanup Permit for Dischargers to Surface Waters of Extracted and Treated Groundwater Resulting From the Cleanup of Groundwater Polluted by Petroleum Hydrocarbons, Solvents, Metals and/or Salts." This RWQCB permit process has been discussed at length with RWQCB senior staff and will take approximately three weeks once the demonstration phase of the project has a firm schedule.

The District and Rialto will also be required to obtain permits from the SCAQMD to reduce air emissions during construction, as well as for operation of the FBR plant. These are customary permits related to project excavation, construction and the routine O&M of the treatment plant, and will be obtained prior to, or as part of the bidding and construction phases of this project.

2. Please identify any known responsible parties. (If there are no known responsible parties, mark as "Unknown")

No final findings of responsibility have been made to date, and only potentially responsible parties have been identified by regulatory agencies. In it's 2009 web-summary of the 160-acre source area site (USEPA, 2009D), the USEPA listed five potentially responsible parties, stating: "Potentially responsible parties (PRPs) refers to companies that are potentially responsible for generating, transporting, or disposing of the hazardous waste found at the site." These five USEPA-designated PRPs for the 160-acre B.F. Goodrich Superfund Site, of which much of the Rialto-Colton Basin contamination has been linked include:

1) Goodrich Corporation;
2) Emhart Industries (on behalf of West Coast Loading Corporation);
3) Pyro Spectaculars;
4) Ken Thompson Inc. (current property owner); and,
5) Chung Ming Wong (current property owner).

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(All references cited below are provided as electronic files on an enclosed CD-ROM as part of the overall grant application.)

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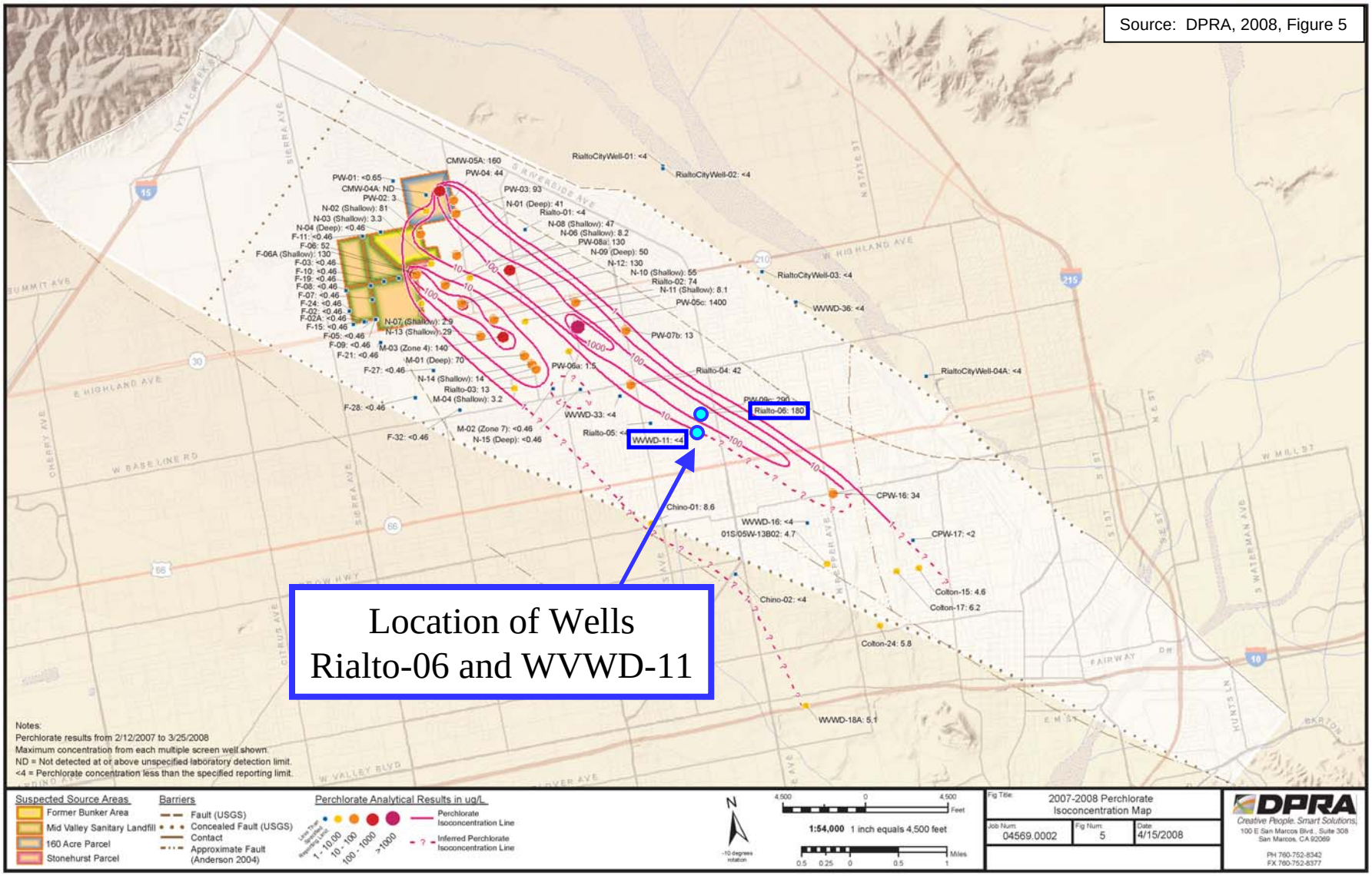
Appendix A

Figures



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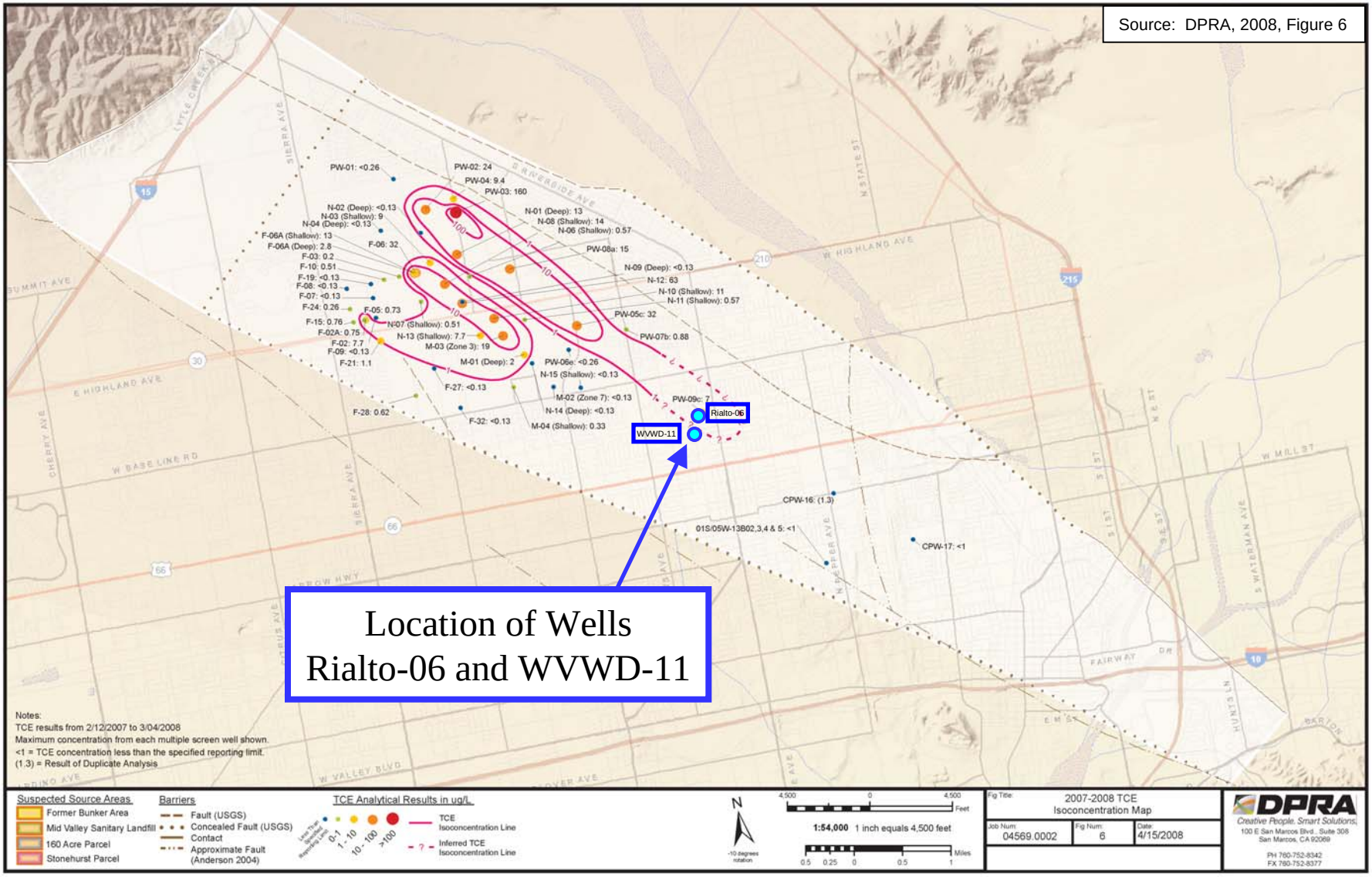
Perchlorate Plume with Wells Rialto-06 & WVWD-11
WVWD Proposition 84 Grant Application

Figure
1-1A



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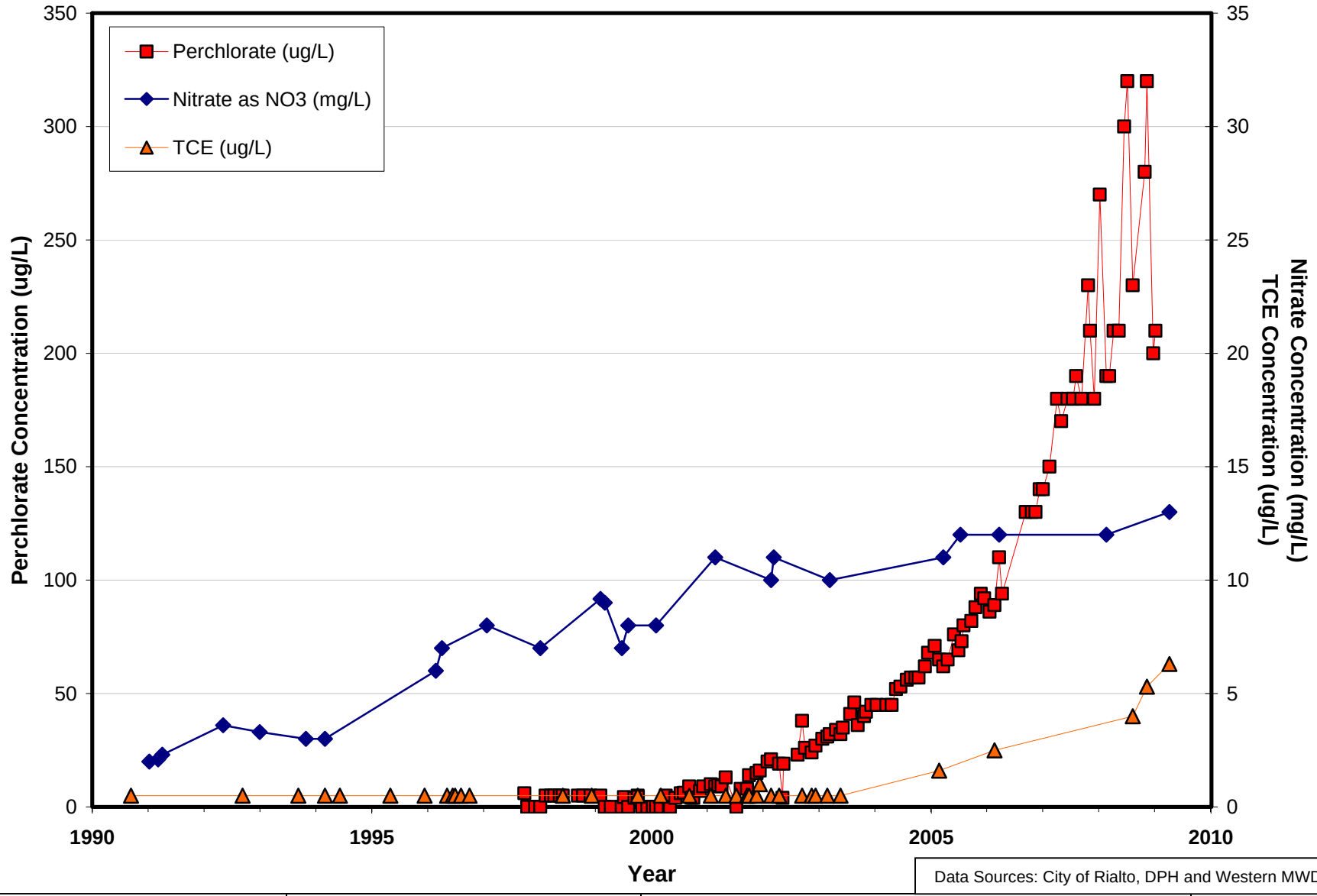
TCE Plume with Wells Rialto-06 & WVWD-11
WVWD Proposition 84 Grant Application

Figure
1-1B



Data Sources: City of Rialto, DPH and Western MWD

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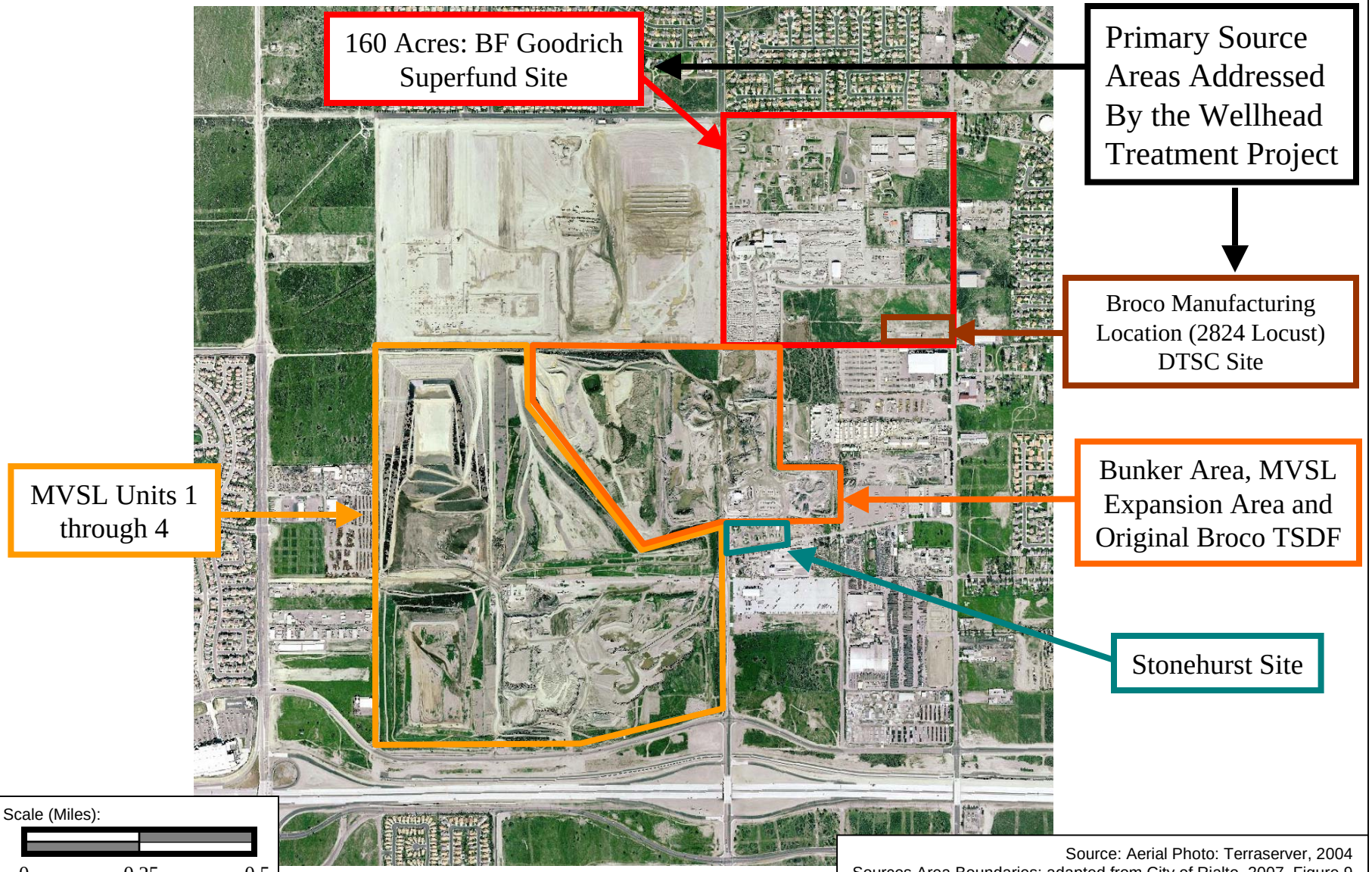
Well Rialto-06 Perchlorate, Nitrate and TCE Hydrograph
WVWD Proposition 84 Grant Application

Figure
1-2



Source: Aerial Photo: Terraserver, 2004
Sources Area Boundaries: adapted from City of Rialto, 2007, Figure 9

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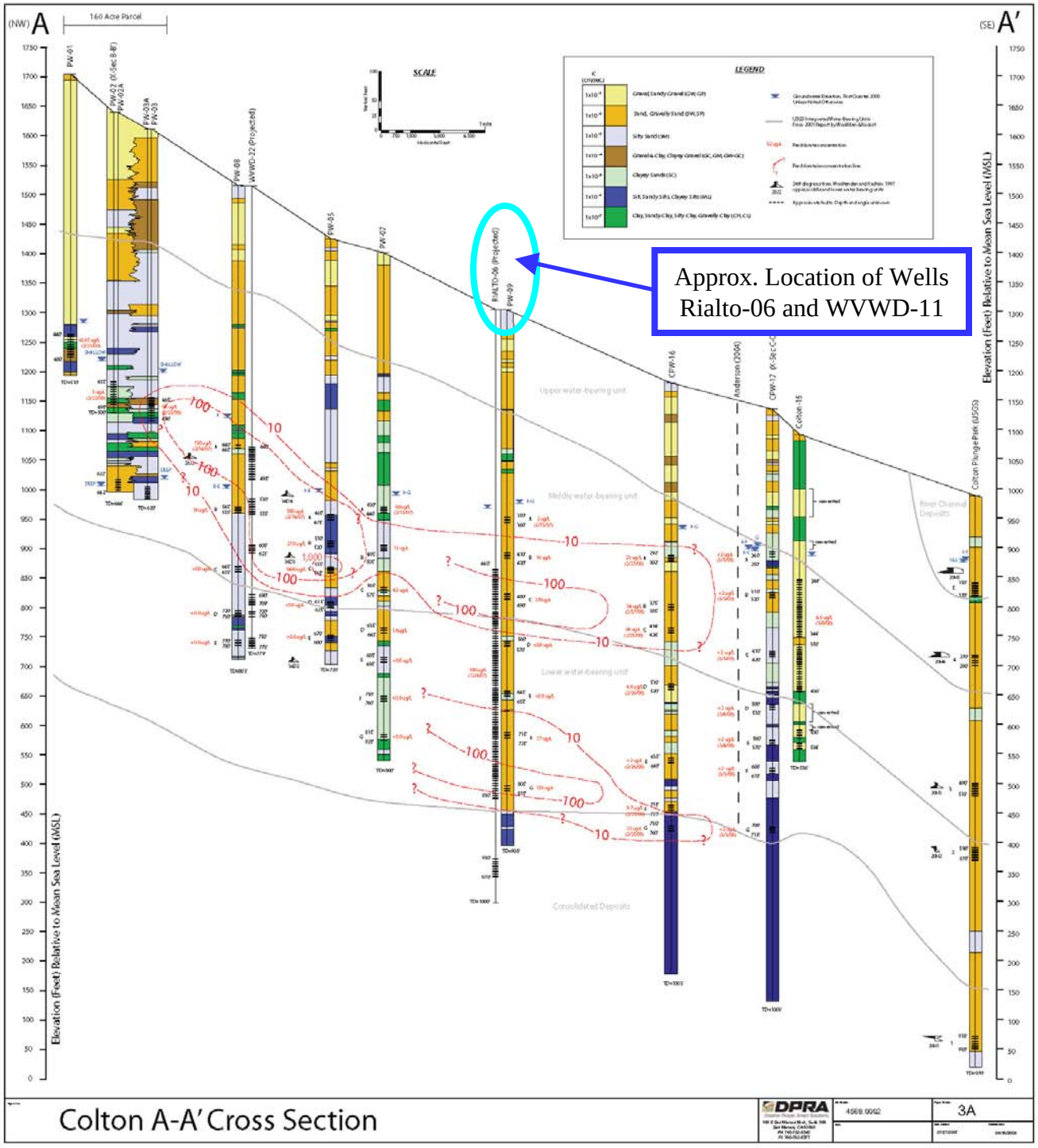
Contaminant Source Areas
WVWD Proposition 84 Grant Application

Figure
1-3

Source: DPRA, 2008, Figure 3A



AQUI-VER, INC. *Hydrogeology, Water Resources & Data Services*	**Perchlorate Plume Cross-Section** **WVWD Proposition 84 Grant Application**	Figure **1-4**

N

0 2,640 5,280 10,560

Feet

1 inch equals 1 miles

State Plane - NAD 83

W - 8

W - 7

W - 6

W - 5

W - 4

W - 3

W - 2

R - 1A

R - 1B

R - 1C

R - 2

R - 3A

R - 3B

W - 3A

215

15

10

Legend

Rialto Municipal Boundary

Pressure Zone:

RIALTO

WVWD

Service Area Boundaries:

RIALTO

WVWD

NOTES:
Base map information and associated data provided by ESRI

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WVWD & Rialto Service Areas & Pressure Zones

WVWD Proposition 84 Grant Application

FIGURE:
1-5

N

0 2,640 5,280 10,560

Feet

1 inch equals 1 miles

State Plane - NAD 83

215

15

10

Rialto - 06

WVWD-11

Legend

Well

Rialto Municipal Boundary

Perchlorate Plume

Pressure Zone:

RIALTO

WVWD

Service Area Boundaries:

RIALTO

WVWD

NOTES:
Base map information and associated data provided by ESRI.
Plume depiction DPRA 2008.

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Y:\Clients\indep\40100454\GIS\GEODATA\MXD\FIG1-6_V1.mxd

WVWD & Rialto Service Areas & Perchlorate Plume

WVWD Proposition 84 Grant Application

FIGURE:

1-6

N

0 2,640 5,280 10,560

Feet

1 inch equals 1 miles

State Plane - NAD 83

215

15

10

Rialto - 06

WVWD-11

Legend

- Well
- Rialto Municipal Boundary
- Perchlorate Plume
- Plume + 10 year TOT buffer

Pressure Zone:

- RIALTO
- WVWD

Service Area Boundaries:

- RIALTO
- WVWD

NOTES:
Base map information and associated data provided by ESRI.
The 10 Year Time of Travel (TOT) buffer of 2,350 feet is the average of the 10-year TOT for Rialto Well 06 and WVWD Well 11 from the 2002 Source Water Assessments overlain on the DPRA, 2008 perchlorate plume depiction.

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Perchlorate Plume, 10-Year TOT & Pressure Zones

WVWD Proposition 84 Grant Application

FIGURE: 1-7

N

0 2,640 5,280 10,560

Feet

1 inch equals 1 miles

State Plane - NAD 83

215

15

10

Legend

Bloomington CDP Boundary

Rialto Municipal Boundary

Service Area Boundaries:

RIALTO

WVWD

NOTES:
Base map information and associated data provided by ESRI

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Y:\Clients\indep\40100454\GIS\GEODATA\MXD\FIG1-8_V1.mxd

Bloomington Census Designated Place & Service Areas

WVWD Proposition 84 Grant Application

FIGURE: 1-8