## Table 3 Selected Remedy Cost Estimate Chemical Oxidation Groundwater KRY Site

Coologis	Item	Unit	Unit Costs	Quantity	Cost	Source	
Finch stainless steel well screen (vertical)   If   \$36.00   3.677   \$132,345.40   Estimate from Casper distributor Swagelok Compression Fittings of per well)   ea   \$57.00   1.044   \$59,508.00   Veredor Quote (Rotary Drilling, 6-inch borchole (< = 100 ft)   If   \$32.00   1.2.255   \$392,160.00   R.ACER   Rotary Drilling, 6-inch borchole (< = 100 ft)   If   \$32.00   1.2.255   \$392,160.00   R.ACER   Rotary Drilling, 6-inch borchole (< = 100 ft)   If   \$32.00   1.2.255   \$392,160.00   R.ACER   Rotary Drilling, 6-inch borchole (< = 100 ft)   If   \$1.00   1.4.925   \$34.925.00   Harrington Plastics   Race   \$1,744.00   348   \$606,912.00   Harrington Plastics   Race   \$1,744.00   248   \$506,912.00   Vendor Quote (Calcon Systems)   Race   \$1,4285.72   25   \$357,143.00   Vendor Quote (Calcon Systems)   Race   \$258   \$393,90.73   10% Scope, 15% bid   Race   \$1,430,973,95   Harrington Plastics   Remedial Design including Plot Testing   \$6%   \$1,430,677.95   Remedial Design including Plot Testing   \$8%   \$10,900.00   \$13,000.00   Race   \$1,430,677.95   Remedial Design including Plot Testing   \$1,430,677.95   Remedial Design including Plot Testing	Geologist	hr	\$75.00	928	\$69,600.00		
Swagehok Compression Etitings (3 per well)	1-inch stainless steel well casing (vertical)	lf	\$24.00	8,579	\$205,884.00		
Rotary Drilling, 6-inch borehole (< = 100 ft)	1-inch stainless steel well screen (vertical)	lf	\$36.00	3,677	\$132,354.00	Estimate from Casper distributor	
A-inch bentonitie seal	Swagelok Compression Fittings (3 per well)	ea	\$57.00	1,044	\$59,508.00	Vendor Quote	
Ozone wellhead assembly         ea         \$1,744.00         348         \$600,912.00         Engineer's estimate from similar project Harrington Plastics           1-inch PVC piping (lateral connection)         If         \$1.00         14,925         \$14,925.00         Harrington Plastics           Ozone System         Is         \$74,685.00         25         \$1,867,125.00         Vendor Quote (Calcon Systems)           SCADA System and radio telemetry         Is         \$14,285.72         25         \$357,1413.00         Vendor Quote (Calcon Systems)           Construction Contingencies         25%         Subtotal         \$3,785,162.93         10% Scope, 15% bid           Additional Tasks           Electricity power pole drop to each system         ea         \$2,500.00         25         \$62,500.00         Engineer's estimate from similar project           Startup and troubleshooting         ea         \$1,000.00         25         \$25,000.00         Engineer's estimate from similar project           Project Management         6%         \$286,887.22         EPA Cost Guidance           Remedial Design including Pilot Testing         5% plus \$100,000         \$673,774.44         EPA Cost Guidance           Construction Management         Image: Construction Management         Image: Construction Management         Image:	Rotary Drilling, 6-inch borehole (< = 100 ft)	1f	\$32.00	12,255	\$392,160.00	RACER	
1-inch PVC piping (lateral connection)         If         \$1.00         14,925         \$14,925,00         Harrington Plastics RACER           Trenching         cy         \$8,55         4,975         \$42,536,25         RACER           Xozone System         ls         \$74,685,00         25         \$1,867,125,00         Vendor Quote (Calcon Systems)           SCADA System and radio telemetry         ls         \$14,285,72         25         \$357,143,00         Vendor Quote (Calcon Systems)           Construction Contingencies         25%         subtotal         \$3,755,162,93         10% Scope, 15% bid           Additional Tasks           Electricity power pole drop to each system         ea         \$2,500,00         25         \$62,500,00         Engineer's estimate from similar project Starup and troubleshooting         ea         \$1,000,00         25         \$25,000,00         Engineer's estimate from similar project Starup and troubleshooting         \$8%         \$286,887,22         EPA Cost Guidance         Engineer's estimate from similar project Starup and troubleshooting         \$8%         \$382,516.29         EPA Cost Guidance           Project Management         8%         \$382,516.29         EPA Cost Guidance           Remedial Design including Pilot Testing         5% plus \$100,000         \$10,000,000	4-inch bentonite seal	ea	\$20.16	348	\$7,015.68	RACER	
Trenching         cy         \$8.5.5         4.975         \$42,536.25         RACER           Ozone System         1s         \$74,685.00         25         \$1,867,125.00         Vendor Quote (Calcon Systems)           SCADA System and radio telemetry         1s         \$14,285.72         25         \$337,143.00         Vendor Quote (Calcon Systems)           Construction Contingencies         25%         \$33,790.73         10% Scope, 15% bid           Additional Taske           Electricity power pole drop to each system         ea         \$2,500.00         25         \$62,500.00         Engineer's estimate from similar project           Startup and troubleshooting         ea         \$1,000.00         25         \$25,000.00         Engineer's estimate from similar project           Project Management         6%         \$286,887.22         EPA Cost Guidance           Remedial Design including Pilot Testing         5% plus \$100,000         \$673,774.44         EPA Cost Guidance           Construction Management         8%         \$382,516.29         EPA Cost Guidance           TOTAL CAPITAL COSTS         \$6,124,631.61           **TOTAL CAPITAL COSTS         \$6,124,631.61           **TOTAL CAPITAL COSTS         \$6,124,631.61 <td colspa<="" td=""><td>Ozone wellhead assembly</td><td>ea</td><td>\$1,744.00</td><td>348</td><td>\$606,912.00</td><td>Engineer's estimate from similar project</td></td>	<td>Ozone wellhead assembly</td> <td>ea</td> <td>\$1,744.00</td> <td>348</td> <td>\$606,912.00</td> <td>Engineer's estimate from similar project</td>	Ozone wellhead assembly	ea	\$1,744.00	348	\$606,912.00	Engineer's estimate from similar project
Ozone System         Is ST4,685.00   25   \$1.867,125.00   \$1807,125.00   \$1807,143.00         Vendor Quote (Calcon Systems) Vendor Quote (Calcon Systems)           SCADA System and radio telemetry         Is Subtat         Subtat         \$3,755,162.93         Vendor Quote (Calcon Systems) Vendor Quote (Calcon Systems)           Construction Contingencies         25%         \$938,790.73         10% Scope, 15% bid           Additional Tasks           Electricity power pole drop to each system         ea         \$2,500.00         25         \$62,500.00   \$25,000.00         Engineer's estimate from similar project           Startup and troubleshooting         ea         \$1,000.00         25         \$25,000.00         Engineer's estimate from similar project           Project Management         6%         \$286,887.22         EPA Cost Guidance           Remedial Design including Pilot Testing         5% plus \$100,000         \$673,774.44         EPA Cost Guidance           Construction Management         8%         \$382,516.29         EPA Cost Guidance           TOTAL CAPITAL COSTS         \$6,124,631.61           ANNUAL OPERATIONS AND MAINTENANCE COSTS           Item         Unit         Unit Cost         Quantity         Cost         Source           Site Operation and Maintenance         hr         \$65.00         2000	1-inch PVC piping (lateral connection)	lf	\$1.00	14,925	\$14,925.00	Harrington Plastics	
SCADA System and radio telemetry         Is a Subtotal subtotal         \$337,134.00 \$3,755,162.93         Vendor Quote (Calcon Systems)           Construction Contingencies         25%         \$938,790.73 \$938,790.73         10% Scope, 15% bid           Additional Tasks         Subtotal         \$4,693,953.66         Engineer's estimate from similar project           Electricity power pole drop to each system         ea         \$2,500.00         25         \$62,500.00         Engineer's estimate from similar project           Startup and troubleshooting         ea         \$1,000.00         25         \$25,000.00         Engineer's estimate from similar project           Project Management         6%         \$286,887.22         EPA Cost Guidance           Remedial Design including Pilot Testing         5% plus \$100,000         \$362,516.29         EPA Cost Guidance           Construction Management         8%         Subtotal         \$1,430,677.95         EPA Cost Guidance           TOTAL CAPITAL COSTS         \$6,124,631.61           ANNUAL OPERATIONS AND MAINTENANCE COSTS         Unit Cost         Quantity         Cost         Source           Item         Unit Cost         Quantity         Cost         Source           Site Operation and Maintenance         hr         \$65,00         200         \$130,000.00         Engi	Trenching	cy	\$8.55	4,975	\$42,536.25	RACER	
Subtotal   \$3,755,162.93   10% Scope, 15% bid	Ozone System	ls	\$74,685.00	25	\$1,867,125.00	Vendor Quote (Calcon Systems)	
Construction Contingencies         25%         \$938,790.73         10% Scope, 15% bid           Additional Tasks         Subtoal         \$4,693,953.66         Image: Contract of the property of the	•	ls	\$14,285.72	25	\$357,143.00	Vendor Quote (Calcon Systems)	
Additional Tasks   Electricity power pole drop to each system   ea   \$2,500.00   25   \$62,500.00   Engineer's estimate from similar project   \$1,000.00   25   \$25,000.00   Engineer's estimate from similar project   \$25,000.00   \$87,500.00   \$87,500.00   \$87,500.00   \$87,500.00   \$87,500.00   \$87,500.00   \$87,74.44   EPA Cost Guidance   EPA Co			Subtotal		\$3,755,162.93	<del>_</del>	
Subtotal   \$4,693,953.66	Construction Contingencies		25%		\$938,790.73	10% Scope, 15% bid	
Electricity power pole drop to each system					\$4,693,953.66		
Startup and troubleshooting         ea         \$1,000.00         25         \$25,000.00         Engineer's estimate from similar project           Project Management         6%         \$286,887.22         EPA Cost Guidance           Remedial Design including Pilot Testing         5% plus \$100,000         \$673,774.44         EPA Cost Guidance           Construction Management         8%         \$382,516.29         EPA Cost Guidance           TOTAL CAPITAL COSTS         \$6,124,631.61           ANNUAL OPERATIONS AND MAINTENANCE COSTS           Item         Unit         Unit Cost         Quantity         Cost         Source           Site Operation and Maintenance         hr         \$65.00         2000         \$130,000.00         Engineer's estimate           Power         kwh         \$0.08         \$1456350         \$116,508.00         Bridger Valley Electric           Water         gal         \$2.25         1000         \$2,250.00         Laramie City           O&M Contingencies         25%         \$62,189.50         10% Scope, 15% Bid           TOTAL YEARLY O&M COSTS         \$310,947.50	Additional Tasks						
Startup and troubleshooting         ea         \$1,000.00         25         \$25,000.00         Engineer's estimate from similar project           Project Management         6%         \$286,887.22         EPA Cost Guidance           Remedial Design including Pilot Testing         5% plus \$100,000         \$673,774.44         EPA Cost Guidance           Construction Management         8%         \$382,516.29         EPA Cost Guidance           TOTAL CAPITAL COSTS         \$6,124,631.61           ANNUAL OPERATIONS AND MAINTENANCE COSTS           Item         Unit         Unit Cost         Quantity         Cost         Source           Site Operation and Maintenance         hr         \$65.00         2000         \$130,000.00         Engineer's estimate           Power         kwh         \$0.08         \$1456350         \$116,508.00         Bridger Valley Electric           Water         gal         \$2.25         1000         \$2,250.00         Laramie City           O&M Contingencies         25%         \$62,189.50         10% Scope, 15% Bid           TOTAL YEARLY O&M COSTS         \$310,947.50	Electricity power pole drop to each system	ea	\$2,500.00	25	\$62,500.00	Engineer's estimate from similar project	
Project Management   6%   \$286,887,20   EPA Cost Guidance			\$1,000.00			Engineer's estimate from similar project	
Remedial Design including Pilot Testing         5% plus \$100,000         \$673,774.44         EPA Cost Guidance           Construction Management         8%         \$382,516.29         EPA Cost Guidance           TOTAL CAPITAL COSTS         \$6,124,631.61           ANNUAL OPERATIONS AND MAINTENANCE COSTS           Item         Unit         Unit Cost         Quantity         Cost         Source           Site Operation and Maintenance         hr         \$65.00         2000         \$130,000.00         Engineer's estimate           Power         kwh         \$0.08         1456350         \$116,508.00         Bridger Valley Electric           Water         gal         \$2.25         1000         \$2,250.00         Laramie City           O&M Contingencies         25%         \$62,189.50         10% Scope, 15% Bid           TOTAL YEARLY O&M COSTS         \$310,947.50					\$87,500.00		
Construction Management         8%         \$382,516.29         EPA Cost Guidance           TOTAL CAPITAL COSTS         \$6,124,631.61           ANNUAL OPERATIONS AND MAINTENANCE COSTS           Item         Unit         Unit         Quantity         Cost         Source           Site Operation and Maintenance         hr         \$65.00         2000         \$130,000.00         Engineer's estimate           Power         kwh         \$0.08         1456350         \$116,508.00         Bridger Valley Electric           Water         gal         \$2.25         1000         \$2.250.00         Laramie City           O&M Contingencies         25%         \$62,189.50         10% Scope, 15% Bid           TOTAL YEARLY O&M COSTS         \$310,947.50	Project Management		6%		\$286,887.22	EPA Cost Guidance	
Subtotal	Remedial Design including Pilot Testing		5% plus \$100,000		\$673,774.44	EPA Cost Guidance	
TOTAL CAPITAL COSTS   \$6,124,631.61	Construction Management				\$382,516.29	EPA Cost Guidance	
ANNUAL OPERATIONS AND MAINTENANCE COSTS    Item			Subtotal		\$1,430,677.95	_	
Item         Unit         Unit Cost         Quantity         Cost         Source           Site Operation and Maintenance         hr         \$65.00         2000         \$130,000.00         Engineer's estimate           Power         kwh         \$0.08         1456350         \$116,508.00         Bridger Valley Electric           Water         gal         \$2.25         1000         \$2,250.00         Laramie City           Subtotal         \$248,758.00           O&M Contingencies         25%         \$62,189.50         10% Scope, 15% Bid           TOTAL YEARLY O&M COSTS         \$310,947.50           Present Value         3%			TOTAL CAPITAL COSTS		\$6,124,631.61		
Site Operation and Maintenance         hr         \$65.00         2000         \$130,000.00         Engineer's estimate           Power         kwh         \$0.08         1456350         \$116,508.00         Bridger Valley Electric           Water         gal         \$2.25         1000         \$2,250.00         Laramie City           Subtotal         \$248,758.00           O&M Contingencies         25%         \$62,189.50         10% Scope, 15% Bid           TOTAL YEARLY O&M COSTS         \$310,947.50	ANNUAL OPERATIONS AND MAINTENANC	E COSTS					
Power         kwh         \$0.08         1456350         \$116,508.00         Bridger Valley Electric           Water         gal         \$2.25         1000         \$2,250.00         Laramie City           Subtotal         \$248,758.00           O&M Contingencies         25%         \$62,189.50         10% Scope, 15% Bid           TOTAL YEARLY O&M COSTS         \$310,947.50           Present Value         3%	Item	Unit	Unit Cost	Quantity	Cost	Source	
Water         gal         \$2.25         1000         \$2,250.00         Laramie City           Subtotal         \$248,758.00         \$62,189.50         10% Scope, 15% Bid           TOTAL YEARLY O&M COSTS         \$310,947.50           Present Value         3%	Site Operation and Maintenance	hr	\$65.00	2000	\$130,000.00	Engineer's estimate	
Water         gal         \$2.25         1000         \$2,250.00         Laramie City           Subtotal         \$248,758.00         \$248,758.00         10% Scope, 15% Bid           O&M Contingencies         \$50,189.50         10% Scope, 15% Bid           TOTAL YEARLY O&M COSTS         \$310,947.50           Present Value         3%	Power	kwh	\$0.08	1456350	\$116,508.00	Bridger Valley Electric	
O&M Contingencies         25%         \$62,189.50         10% Scope, 15% Bid           TOTAL YEARLY O&M COSTS         \$310,947.50           Present Value         3%	Water	gal	\$2.25	1000	\$2,250.00		
TOTAL YEARLY O&M COSTS \$310,947.50  Present Value 3%				Subtotal	\$248,758.00		
Present Value 3%	O&M Contingencies		25%		\$62,189.50	10% Scope, 15% Bid	
			TOTAL YEARLY O&M COSTS		\$310,947.50		
Present value includes capital costs and O&M costs for 10 years 10 years \$8,777,080.00				Present Value	3%	٦	
	Present value includes capital costs and O&M costs	for 10 years		10 years	\$8,777,080.00		

KRY Site Record of Decision, MDEQ June 2008