Demonstrating a Market-Based Approach to the Reclamation of Mined Lands in West
Virginia

Quarterly Report
July 1, 2005--September 30, 2005

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DE-FC26-03NT41899R07

July 19, 2006

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ABSTRACT

This is the seventh quarter progress report of Phase II of a three phase project to develop and evaluate the efficacy of developing multiple environmental market trading credits on a partially reclaimed strip mined site near Valley Point, Preston County, WV. The work this quarter focused on developing a revised scope of work for completing the project. The purchase order with Tumbleweed Enterprises for preparation of the reforestation site was terminated. In addition, we continued to monitor the performance of the acid mine drainage (AMD) passive treatment system.

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EXECUTIVE SUMMARY

This is the seventh quarter progress report of work accomplished to develop and evaluate the efficacy of developing multiple environmental trading credits on mined land to encourage enhanced reclamation, more quickly and at less public cost. Project objectives are to develop hypothetical carbon sequestration and water quality trading credits by reforesting a 10-hectare area with five species of commercial hardwood tree seedlings and designing and constructing a passive AMD treatment system to improve water quality. The project site is located on a partially reclaimed surface mine near Valley Point, Preston County, WV.

The purchase order with Tumbleweed Enterprises, for construction of the ash haul road, site clearing and grubbing and ash spreading was terminated .

Monitoring of the passive AMD treatment system continued and that data and system performance evaluation is contained herein.

EXPERIMENTAL

Passive AMD treatment system performance monitoring was conducted at the treatment system discharge using sampling and analytical methodologies described in the first quarter report.

RESULTS AND DISCUSSION

Passive AMD treatment system performance monitoring results are shown in Table 1.

Table 1 Passive Treatment System Monitoring Results.

Project Site Sample ID date	Units	Connor Run					Post Const. Average	% Reduction	Amount Red. kg/yr
		Pre Const. Ave. Baseline	System Out 7/28/2005	System Out 8/24/2005	System Out 9/14/2005				
Flow	GPM	6.07	3.14	0.25	Dry		1.70		
Flow	L/Min	22.97	11.88	0.95			6.42		
F pH		3.06	6.05	5.66			5.86		
Lab pH		3.18	6.2	6.4			6.3		
acidity	mg/L	206.88	19	11			15		
est acidity	mg/L	250.11	6.74	5.58			6.16	97.54	
alkalinity	mg/L	0.00	14	14			14		
acid-alk	mg/L	250.11	-7.26	-8.42			-7.84		
Mg	mg/L	43.39	14	8.69			11.35		
Ca	mg/L	51.18	59.8	40.5			50.15		
Fe	mg/L	19.03	0.28	0.7			0.49	97.43	
Al	mg/L	21.25	0.05	0.05			0.05	99.76	
Mn	mg/L	13.53	3.12	1.87			2.495	81.56	
SO4	mg/L	507.38	185	131			158		
cond	µS/cm	1147.13	397	260			328.5		
acid load	kg/yr	3031.29	42.25	2.79			20.85	99.31	3010.44
Fe Load	kg/yr	230.65	1.76	0.35			1.66	99.28	228.99
Al Load	kg/yr	257.54	0.31	0.02			0.17	99.93	257.37
Mn Load	kg/yr	164.01	19.56	0.93			8.44	94.85	155.57

All performance monitoring data represented in Table 1 were collected from the treatment system discharge. The performance evaluation is based on a comparison between an average of discharge concentrations and loadings (two samples) to the average baseline (pre-construction) quality (seven samples). Comparison to baseline conditions is used because the system intercepts subsurface/subaerial flow and therefore it is impossible to collect a representative sample and flow upstream of the treatment system.

This quarter's monitoring data indicates a system removal efficiency of 97.5 % for acidity, 97.4% for iron, 99.8 % for aluminum and 81.6% for manganese. Pollutant loading reductions exceed 99% for acidity, iron and aluminum and 94.8 % for manganese. These data indicate outstanding pollutant removal efficiency.

The revised project scope revision is included in Appendix A. The objective of this project phase is to develop a user-friendly guide for landowners and investors to determine the economic benefits of developing carbon sequestration, wetland and conservation banking and water quality credits on surface mined lands.

CONCLUSION

The passive AMD treatment system is achieving excellent pollutant reductions in acidity, iron, aluminum and manganese.