



Release Date: August 19, 2009

DOE Projects to Advance Environmental Science and Technology

Nine Unconventional Natural Gas Projects Address Water Resource and Management Issues

Washington, D.C. — The Office of Fossil Energy's National Energy Technology Laboratory (NETL) has selected nine new projects targeting environmental tools and technology for shale gas and coalbed methane (CBM) production. NETL's goals for these projects are to improve management of water resources, water usage, and water disposal, and to support science that will aid the regulatory and permitting processes required for shale gas development.

A primary goal of Fossil Energy's Oil and Natural Gas Program is to enhance the responsible development of domestic natural gas and oil resources that supply the country's energy. A specific objective is to accelerate the development and demonstration of technologies that will aid our country's independent producers in dealing with use and treatment of water related to natural gas and oil production.

Operators face new challenges as well as new opportunities in developing resources such as shale gas. The following recipients will help provide the new technologies, tools, strategies, and knowledge toward reliable and environmentally responsible development of natural gas.

Excerpt below from the nine projects mentioned in the News Release:

Altela, Inc., Albuquerque, N.M. —

This project will demonstrate that the AltelaRain® technology can be successfully deployed in a cost-effective manner to treat the produced and flowback water from Marcellus Shale, and that it can operate within state and federal regulatory requirements. (DOE share: \$886,025; recipient share: \$912,316; duration 18 months)



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PA DEP Water Analytical Report - November 2009

AltelaRain® ARS-4000 System - Butler County, PA

	DESCRIPTION	11/24/09 RAW RESULTS	11/24/09 CON RESULTS	11/24/09 DISTILLED RESULTS
1	Chloride - IC	10416.0 mg/L	66205. mg/L	51.0 mg/L
2	Osmotic Pres	542 MOSM	2350 MOSM	18 MOSM
3	Bromide	106.0 mg/L	631.0 mg/L	< 0.2 mg/L
4	Amonia-N T	33.47 mg/L	99.34 mg/L	Cancelled
5	Selenium T	< 70.0 ug/L	70.2 ug/L	< 7 ug/L
6	Thallium T	< 20.0 ug/L	< 20.0 ug/L	< 2 ug/L
7	Arsenic T	< 30.0 ug/L	< 30.0 ug/L	< 3.0 ug/L
8	Arsenic D	< 30.0 ug/L	< 30.0 ug/L	Cancelled
9	Lead T	< 10.0 ug/L	66.0 ug/L	< 1.0 ug/L
10	Lead D	< 10.0 ug/L	72.4 ug/L	Cancelled
11	Antimony T	< 20.0 ug/L	35.2 ug/L	< 2.0 ug/L
12	Antimony D	< 20.0 ug/L	36.6 ug/L	Cancelled
13	Selenium D	< 70.0 ug/L	< 70.0 ug/L	Cancelled
14	Thallium D	< 20.0 ug/L	< 20.0 ug/L	Cancelled
15	Silver D	10.0 ug/L	10.0 ug/L	Cancelled
16	Cadmium D	10.0 ug/L	10.0 ug/L	Cancelled
17	Chromium T	50.0 ug/L	50.0 ug/L	< 50.0 ug/L
18	Copper T	10.0 ug/L	320.0 ug/L	13.0 ug/L
19	Potassium D	59.8 mg/L	365.0 mg/L	Cancelled
20	Lithium D	13200.00 ug/L	79300.0 ug/L	Cancelled
21	Magnesium T	85.60 mg/L	564.0 mg/L	0.664 mg/L
22	Manganese T	800.0 ug/L	3990.0 ug/L	169.0 ug/L
23	Manganese D	720.0 ug/L	3740.0 ug/L	Cancelled
24	Silver T	10.0 ug/L	10.0 ug/L	< 10.0 ug/L
25	Aluminum T	200.0 ug/L	200.0 ug/L	< 200.0 ug/L
26	Aluminum D	200.0 ug/L	200.0 ug/L	Cancelled
27	Barium T	5530.0 ug/L	32000.0 ug/L	338.0 ug/L
28	Barium D	6220.0 ug/L	29900.0 ug/L	Cancelled
29	Beryllium T	1.0 ug/L	1.0 ug/L	< 1.0 ug/L
30	Beryllium D	1.0 ug/L	1.0 ug/L	Cancelled
31	Calcium D	780.0 mg/L	5080.0 mg/L	Cancelled
32	Calcium T	895.0 mg/L	5730.0 mg/L	6.52 mg/L
33	Cadmium T	10.0 ug/L	10.0 ug/L	< 10.0 ug/L
34	Chromium D	50.0 ug/L	50.0 ug/L	Cancelled
35	Copper D	10.0 ug/L	300 ug/L	Cancelled
36	Iron D	11800.0 ug/L	18500.0 ug/L	Cancelled
37	Iron T	13800.0 ug/L	20200.0 ug/L	526.0 ug/L
38	Potassium T	66.0 mg/L	404.0 mg/L	< 1.0 mg/L
39	Lithium T	14700.0 ug/L	84500.0 ug/L	70.0 ug/L
40	Magnesium D	77.1 mg/L	504.0 mg/L	Cancelled
41	Sodium T	5770.0 mg/L	34500.0 mg/L	24.4 mg/L
42	Sodium D	4930.0 mg/L	30100.0 mg/L	Cancelled
43	Nickel T	50.0 ug/L	50.0 ug/L	< 50 ug/L
44	Nickel D	50.0 ug/L	50.0 ug/L	Cancelled
45	Zinc T	10.0 ug/L	1120.0 ug/L	62.0 ug/L
46	Zinc D	10.0 ug/L	1020.0 ug/L	Cancelled
47	Hardness T	2590 mg/L	16649 mg/L	19 mg/L
48	Hot Acidity	4.8 mg/L	-88.80 mg/L	-12.8 mg/L
49	pH	6.2 pH units	6.3 pH units	7.0 pH units
50	SPC @ 25.0 C	29100.00 umhos/cm	> 111900.0 umhos/cm	276.0 umhos/cm
51	Alkalinity	165.2 mg/L	434.8 mg/L	34.2 mg/L
52	TDS @ 105 C	23586. mg/L	136522. mg/L	122. mg/L
53	TSS Wash 3x	48 mg/L	84 mg/L	< 5 mg/L
54	Sulfate - IC	21.6 mg/L	< 5.0 mg/L	1.69 mg/L