Table 6

Comparison of WWE March 2003 Report Statement/Subject Matter with Field Data Collected from Four Exploration Wells

WWE March 2003 Report Statement or Subject Matter	Field Data from Four Exploration Wells Consistent or Inconsistent with Statement/Subject Matter?
1. Characterization of geology in study area associated with four wells.	Consistent, with exception of unforeseen andesitic volcanic dike at Dever Creek #1 Well, and andesite potentially encountered at Spaulding Peak #1.
2. Projected depths of formations.	Consistent to within 100 feet of formations located above the Coal Bearing Member, and approximately 200 feet for the coal seams and underlying formations.
3. Anticipated gas explorations zones.	Consistent.
4. Hydraulic fracturing will likely not be extensive, for a host of reasons (provided in the March 2003 report).	Consistent. Hydraulic pressure plots associated with formation stimulations in the Coal Bearing Member appear to show that hydraulic pressures exerted on the formation never exceeded the initial stimulation fracture pressure. This leads to the conclusion that the hydraulic fracturing appears to have stayed within the anticipated stimulation zone.
5. No impact to surface water from hydraulic stimulation will occur because there will be no hydraulic connection between the fracture zone and the surface water.	Consistent. The hydraulic fracturing data indicate that the uppermost fractures are far beneath the ground surface. No hydrologic connection between the hydrofractures and surface waters was established in any of the four wells.
6. Approximately 0.5 AF of water will be trucked from the Oxbow Mining facilities to the four sites to drill and hydraulically stimulate each well.	Consistent on quantity but not source. Imported water sources included surface ponds, commercial sources and leased water rights not associated with the Oxbow Mining facilities.
7. The space between the outside of the steel casing and inside of the drill hole (annulus) will be filled with cement (grout) from top to bottom, thus isolating gas production zones and minimizing potential impacts to groundwater.	Consistent for Dever Creek and Spaulding Peak #1, but not for Lone Pine and Stevens Gulch #1 (see Figures 2 and 3). Although most of the lengths of the Lone Pine and Stevens Gulch #1 were cemented, there are gaps. Should those wells be placed into production, those portions of the production casing in direct communication with the formation will be cemented.
8. Hydraulic fractures are created by pumping a thick, water based non-hazardous fluid into the formation. GEC anticipates that the majority of the fracturing fluid will be recovered, with the remainder posing no residual hazard.	The description of the hydraulic fracturing fluid is correct. Based on the data that were available when this report was prepared, in some of the zones where hydro-fracturing occurred, the majority of the fluid was recovered, while in other zones, less than 50% was recovered. GEC anticipates that once monitoring activities resume after the winter shut-in period is over, these recovery percentages will increase. That portion of the fracturing fluid which has not been recovered poses no concern, due to the non-hazardous constituents of the stimulation fluid.
9. No impact to surface waters from produced water will occur. Produced water will be collected and transported to a licensed disposal facility	Consistent. Produced water was managed in the manner described and there have been no impacts to surface waters from produced water discharges.
10. The State Engineer's Office (SEO) permitted water wells that are within 1-mile of the proposed exploratory wells withdraw shallow groundwater from unconsolidated alluvial/colluvial deposits. These deposits will not be impacted by the exploratory wells because these wells will be cased and cemented to a level below all water supply wells	Consistent. All four of the wells were cased and cemented to a level below the water supply wells within a 1-mile radius. Hydraulic stimulations occurred only in the Mesaverde Formation. Hydraulic pressure plots associated with these stimulations suggest that the tops of the projected hydro-fracture zones are far below the unconsolidated deposits.

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and will be hydraulically stimulated only in the Mesaverde Formation. The top of the projected hydro-fracture zone will be far below the unconsolidated deposits.	
11. An important consideration regarding the large separation distances between the hydraulic fracture zone and the water wells is that when a fracture reaches deformable, soft rock, it will stop propagating. This will provide additional protection for the shallow groundwater wells and surface water resources.	Consistent. The well logs demonstrate that there is substantial soft, deformable rock above the Mesaverde Formation, thereby creating the anticipated protection.
12. The only hazardous chemicals to be used at the exploratory well sites are diesel fuels for equipment, used in well completion activities and dilute hydrochloric acid.	GEC confirmed that this was case.
13. Substantial evidence indicates that the coal seams of the South Flank of the Grand Mesa will produce only small amounts of water, typically, less than the flow of a garden hose. Although isolated lenses of groundwater will be encountered when drilling, inflow rates from these lenses will decrease or dry up with time.	In general, the data from the four exploration wells support these statements, and groundwater inflows were isolated. There were some zones of substantial inflow, typically in association with fractures. In addition, the significant inflows observed at the Lone Pine well at depth are associated with Mesaverde Formation water that does not have a surface water connection. GEC was unable to continue monitoring the rate of groundwater inflows to the Lone Pine Well before winter shut-in. However, when well monitoring resumes, the rate of inflow to the Lone Pine Well will likely have declined, based on the experiences of numerous coal mines in the study area.
14. There is no evidence to suggest a continuous hydraulic connection between the top of the Grand Mesa and the Mesaverde Formation. There is also no reliable evidence which substantiates that the potentiometric surface of the Mesaverde Formation beneath the top of the Grand Mesa is elevated by thousands of feet above the formation itself, and there is much evidence to the contrary.	Consistent with field observations in all four wells.