

DOCKETED

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August 9, 2013

Mr. John Heiser
California Energy Commission
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Re: Comment on Risk of Well Blowouts from Enhanced Oil Recovery Operations - Hydrogen Energy California Project (HECA), 08-AFC-08A

Dear Mr. Heiser:

Recent news reports about well blowouts from carbon sequestration projects in Mississippi and Louisiana require staff to work with DOGGR to ensure that Occidental of Elk Hills, Inc. (OEHI) immediately conducts a thorough inspection of plugged and abandoned wells on the Elk Hills Oil Field. Attached to this letter (Exhibit A) is a recent Associated Press story about a number of well blowouts resulting from carbon dioxide enhanced oil recovery operations. According to the report, so much carbon dioxide escaped from one well, carbon “settled in some hollows, suffocating deer and other animals.” After injection began and several of dangerous blowouts occurred, the company later concluded that many of the old wells “had been improperly plugged and abandoned by prior operators and did not

have sufficient cement in them.” Mississippi DEQ officials fined the company because “Denbury should have more closely inspected abandoned wells before it began injecting carbon dioxide. Instead the company may have relied too much on paper records of old wells....”

There are over 1,000 wells that penetrate the reservoir within the project area where OEHI proposes to inject the carbon dioxide from the HECA plant.¹ Given the large number of wells penetrating the area, staff appropriately concluded in the PSA that the potential for leaks through the well bores “could be quite significant.”² Staff also accurately identified the risk for well leakage in data request number 54: “There are hundreds of wells that penetrate the Reef Ridge (RR) shale, but no information is available as to their integrity and keeping their casing and cement components from being corroded/eroded away by the combination of CO₂ and carbonic acid. This information will be necessary for staff’s analysis.”³ OEHI, however, has not adequately responded to staff and the PSA does not contain sufficient background information, proposed conditions, analysis of alternatives or mitigation that would ensure that the well failures happening in Mississippi and Louisiana cannot occur in Kern County.

OEHI relied on old records to support its conclusion that abandoned and inactive wells will not provide leakage pathways. In its proposed MRV plan, OEHI

¹ PSA 4.3-59.

² Id.

³ OEHI Response to CEC DRs 51-55 (June 6, 2012), at <http://docketpublic.energy.ca.gov/PublicDocuments/Regulatory/08-AFC-8A/2012/June/TN%2065750%2006-06-12%20Occidental%20of%20Elk%20Hills,%20Inc.%20Response%20to%20CEC%20Data%20Requests%2051-55%20and%20Oxy%20Elk%20Hills%20MRV%20Plan%20for%20the%20H.pdf>.

claimed abandoned wells will not provide pathways for leakage based on “extensive operating records.”⁴ These operating records are critical, but they have not been summarized or presented for staff and public review. OEHI also supported its conclusion by pointing out that its injection of water since 1983 has not caused any leakage problems. The fact that water injection has not caused problems, however, does not dispel the concerns that injection of carbon dioxide will corrode well casing, or that the wells are at risk for leakage or blowout in future.

OEHI has generally ignored staff’s concern about well integrity and the risk of well corrosion. OEHI responded to staff data request 54 by stating in part that: “All wellbores that penetrate the Reef Ridge formation will have a cement top which extends in to the base of the Reef Ridge or higher. Industry technical studies indicate that the phenomenon of dissolution of cement by carbonic acid is slow, so slow as to not pose a credible risk of failure of the cement seal, and in some conditions reaches chemical equilibrium.”⁵ This response does not adequately address overall well integrity, and the company’s claim that the “risk is so slow as to not pose a credible risk of failure” needs to be reassessed given the recent events in Mississippi and Louisiana.

The PSA recommended that the monitoring network, which currently monitors only active wells, “should be extended to include plugged and abandoned wells.”⁶ Monitoring of the plugged and abandoned wells is necessary but not sufficient under CEQA. For example, simply monitoring a potentially significant

⁴ Id.

⁵ Id.

⁶ PSA 4.3-59.

impact does not constitute mitigation of that impact. Given the recent news of well leakage in Mississippi and Louisiana due to enhanced oil recovery operations, CEC and DOGGR must require a thorough examination of all of the abandoned and capped wells around the proposed injection site, including an analysis of age, well integrity and cap integrity, track record and the reliability of well records. The results of this investigation must be provided for public review and comment in conformance with CEQA.

Sincerely,

A handwritten signature in black ink, appearing to read "Andrea Issod". The signature is fluid and cursive, with the first name being more prominent than the last.

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Denbury pays big fine for 2011 oil well blowout

By JEFF AMY, Associated Press

Updated 6:31 pm, Thursday, July 25, 2013

JACKSON, Miss. (AP) — Denbury Resources promises to bring new life to old oil fields by pumping in carbon dioxide to force additional oil to the surface. But the company's oil fields have seen a series of uncontrolled carbon dioxide blowouts that may bring up oil and drilling fluids with them.

Now, one of the biggest of those blowouts has resulted in Denbury agreeing to pay a \$662,500 fine to the Mississippi Department of Environmental Quality over a 2011 oil well blowout in Yazoo County. It's one of the largest environmental fines Mississippi has assessed in the last 10 years.

And questions linger about whether Denbury and other companies pumping carbon dioxide underground are doing enough to ensure long-abandoned oil wells are safely capped and can stand up to the pressure that shoves up the oil.

Denbury has had at least two other Mississippi blowouts since 2007. It has been fighting another release near Delhi, La., since June 13. There, carbon dioxide and drilling fluids broke through the ground's surface.

Denbury, based in Plano, Texas, says the technique is decades old and it operates safely.

"Prior to commencing injections of carbon dioxide into an oil field, Denbury creates a development plan that includes an analysis of previously drilled well records," spokesman Ernesto Alegria wrote in an email Thursday. "Denbury's primary objective in creating the plan is to develop these fields in the safest and most efficient manner."

In 2007, the company saw carbon dioxide releases in Mississippi's Lincoln and Amite counties. In December 2007, a few Amite County homes were evacuated after a well that Denbury was working on blew out.

Already by that time, some in southwest Mississippi had warned that the pressure of the carbon dioxide could cause wells that had been capped decades ago to rupture. Environmental regulators said Thursday that's what happened at an abandoned well south of Yazoo City. The well's metal pipe had been stripped and the 2,000-foot-deep hole vented carbon dioxide, oil and drilling mud for 37 days starting Aug. 9, 2011.

So much carbon dioxide came out that it settled in some hollows, suffocating deer and other animals, Mississippi officials said. The company ultimately drilled a new well to plug the old one, and removed 27,000 tons of drilling mud and contaminated soil and 32,000 barrels of liquids from the site.

"It had serious impacts in the immediate vicinity," said Richard Harrell of the Mississippi DEQ.

Monitoring wells show no contamination in underground water supplies. That's a threat because the well crosses an aquifer used for drinking water in the Jackson area. Deeper down, it also crosses the Sparta aquifer, a significant drinking water source across the lower Mississippi Valley.

"Denbury has worked with government and local officials and agencies to thoroughly remediate any isolated and unrelated releases of well fluids in our operated fields," Alegria said.

Harrell said Mississippi fined the company because officials believe Denbury should have more closely inspected abandoned wells before it began injecting carbon dioxide. Instead, the company may have relied too much on paper records of old wells at the Mississippi Oil and Gas Board.

"A lot of this work, we felt, should have been done before they started flooding the field," Harrell said. "It was somewhat preventable."

The company said in a later stock filing that it re-plugged 28 wells in the Tinsley field. However, it never told stockholders about the blowout, only saying it slowed carbon dioxide injections and oil production because "we found that multiple wells, many dating back to the 1940s and 1950s, had been improperly plugged and abandoned by prior operators and did not have sufficient cement in them."

Mississippi Oil and Gas Board attorney Howard Leach said he didn't know of any new regulations to prevent a repeat. But carbon dioxide releases have continued.

Mississippi officials said corrosion in the top of a well casing allowed the gas to escape and bubble up in nearby water well in the Heidelberg field in Jasper County earlier this year.

More serious is what some people have termed an "underground blowout" near Delhi, La., in another old oil field that Denbury is reviving.

That incident was detected in northeast Louisiana's Franklin Parish on June 13, when a monitor showed unsafe concentrations of methane in the air. At first, authorities suspected a natural gas pipeline, but Louisiana Department of Natural Resources spokesman Patrick Courreges said it now appears two or more plugged wells gave way underground. Methane, carbon dioxide, oil, water, brine and sands pushed up through the earth in a sparsely populated, marshy area.

Concentrations of carbon dioxide were so high initially that Courreges said responders wore breathing apparatus to keep from suffocating.

Courreges said Denbury has stabilized the situation by pumping in "kill fluid" — water with lots of calcium chloride that forms a barrier keeping carbon dioxide from surfacing. He said hundreds of Denbury employees and contractors continue working in the area.

Courreges said that this is the first time that Louisiana regulators know of that carbon dioxide has vented to the surface in such large quantities. He said a cleanup will be needed, but because the investigation is still going on, he couldn't speculate about whether the state would fine Denbury. He also said it was too soon to tell whether Louisiana would change regulations governing enhanced oil recovery.

The company is using the same technique in Texas, Wyoming and Montana. Alegria said Denbury "works to apply the information gained from operating these floods to further improve their safety and efficiency."

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