

than what we would expect in a reducing, anaerobic environment. If HSA uses a lower DO value, then the calculation in Appendix A need to be revised.

- 5) **"Active" versus "passive" pilot test-** We understand HSA proposes the use of an "active" system to reduce the duration of the pilot test. We further understand that if lactate treatment were incorporated as an element in the final remedy for the site, the lactate treatment would likely be "passive". Intel should be aware that the conclusions that may be drawn from the "active" pilot test may not directly and/or completely apply to a "passive" system.

- 6) **Natural Attenuation Screening Score-** Prior to implementing the pilot test, DEQ recommends HSA use site data to complete Table 1 in their proposal to support the pilot test.

- 7) **Pore Volume and pumping rate-** DEQ understands "pore volume" to mean the treatment volume. In their calculation of pore volume, HSA used a porosity of 0.15. Previously in this project, a porosity value of 0.40 was used (EMCON's "Revised Capture Zone Analysis" dated September 12, 1995). A treatment volume of approximately 74,000 gallons was calculated using a porosity value of 0.40, versus 27,760 gallons using a porosity value of 0.15. HSA should either justify using a porosity value of 0.15 or use the porosity value of 0.40 in their treatment volume calculation.

The proposed pumping rate of 1gpm will produce approximately 27,000 gallons of groundwater (i.e., one treatment volume using a porosity value of 0.15) in 19 days. If HSA uses a porosity value of 0.40, then the treatment volume or pumping rate will be to be revised.

Dan, The saturated WS zone is estimated to be 35' thick, but the test well & recovery well will only go down to 30'bgs with 20' screens. Will these non-fully penetrating wells screw up purging the treatment volume?

- 8) **Underground Injection Control (UIC)-** Under DEQ's new UIC Rules (OAR 340-044-005 through -0055), the lactate injection wells are considered Class IV injection systems and are regulated under the UIC Rules. Since the pilot test will be conducted under DEQ oversight, the injection wells need not be permitted, however, the wells need to be registered with DEQ's UIC Program prior to use. For questions regarding well registration, please contact Barbara Priest at DEQ (503-229-5945 or [priest.barbara@deq.state.or.us](mailto:priest.barbara@deq.state.or.us)). General information regarding DEQ's UIC Program can be found at:

<http://waterquality.deq.state.us/wq/groundwa/uichome.htm>

If you have any questions or concerns regarding this letter or any other project issues, please call me at (503) 229-6825 or e-mail me at [anderson.jim@deq.state.or.us](mailto:anderson.jim@deq.state.or.us).

Jim - a few comments below.

Jim

July XXX, 2001

Ms. Julie Cafferata  
Intel Corporation  
AL4-91  
5200 NE Elam Young Parkway  
Hillsboro, Oregon 97124-6497

Re: Potassium Lactate Pilot Study Proposal,  
Intel Facility, 3585 SW 198th Ave  
Aloha, Oregon  
ECSI No. 1131

Dear Julie:

The Voluntary Cleanup Program (VCP) of the Department of Environmental Quality (DEQ) reviewed HSA's June 6, 2001 "Potassium Lactate Pilot Study Proposal" for the Intel Aloha facility project. DEQ has a number of comments on the proposal presented in the remainder of this letter. HSA should revise the proposal resolving DEQ's concerns and resubmit the revised proposal for DEQ's review and approval.

- 1) **Configuration and operation of the wells**- HSA should include the following elements in the revised proposal:
  - The downgradient distance of the recovery well from the test well.
  - Explain the difference/relationship of the recovery well and test well.
  - What is the pumping schedule for the test well and recovery well? Will both wells be pumped simultaneously?
  - Will the recovery well be sampled, and if so at what schedule?

*Figure the location of six pilot test wells should be shown on a figure.*
- 2) **Pre-injection water quality conditions**- The proposal states that the test well will be pumped for 24 hours at 1 gpm to define pre-injection water quality conditions. What is the purpose of pumping the well for 24 hours?
- 3) **Table 2**- The text refers to an injection, pumping, and sampling schedule presented in Table 2. The proposal did not include the table 2.  
*this information is*
- 4) **Dissolved Oxygen (DO)**- The proposal calculation use a DO value of 8 mg/L. The proposal states that reductive dechlorination is occurring at the site. The DO value of 8 mg/L is higher

Intel, Aloha Campus  
June 15, 2001

Sincerely,

James M. Anderson  
Project Manager  
Voluntary Cleanup/Portland Harbor

cc: Russ Bunker, IT Corporation  
Tom Gainer, DEQ NWR  
Dan Hafley, DEQ NWR  
Ralph Moon, HSA



**ANDERSON Jim M**

**From:** GAINER Tom  
**Sent:** Monday, July 16, 2001 3:54 PM  
**To:** ANDERSON Jim M  
**Cc:** HAFLEY Dan; GAINER Tom  
**Subject:** Intel-Aloha Pilot Test

I reviewed the 6/6/01 Pilot Study Proposal for the Intel-Aloha site and have the following comments: Dan reviewed

1. Are Appendix A assumptions on subsurface geochemistry ok?
- Comment # 3 ✓ 2. An injection, pumping, and sampling schedule is not provided in Table 2 as suggested.
- Comment # 7 ✓ 3. Appx. A says biweekly injections should provide a constant presence of lactate since the residence time is ~19 days. However, the plan calls for injections every 21 days. This is inconsistent, not conservative, and not explained/justified.
- Comment # 1 ✓ 4. The difference /relationship between the test well and the recovery well is not clear. The test well will be pumped at 1 gpm and used for sampling. And the recovery well?
- Comment # 1 ✓ 5. It's hard to follow the location and pumping /sampling plan for the 6 pilot test wells. For example, if the downgradient well is pumped, will that well or the center "test well" be sampled? — test well, see "Monitoring Parameters"
- Comment # 9 ✓ 6. Appx. A calls for 2.5 gal. 60% lactate/injection well, or 7.5 gal. 60% lactate/injection event. Since it appears that a total of 7.5 gal. 60% lactate is required for treatment in this area, the entire pilot test will deliver 5-6 times the lactate required. Does this seem a bit high?
- Comment # 5 ✓ 7. From Dan's comments: my understanding is that this "active" pilot approach would be applied full-scale as well (as opposed to passive injections). The pilot study's approach should be the same as that planned for full-scale. So if they're planning to use the passive approach full-scale, then they shouldn't be toying with this active approach in the pilot study.

Please contact me if you have any questions.  
Thanks-

**Tom Gainer, P.E.**

Senior Environmental Engineer  
Oregon Department of Environmental Quality-NW Region  
Voluntary Cleanup and Portland Harbor Section  
503-229-5326  
[gainer.tom@deq.state.or.us](mailto:gainer.tom@deq.state.or.us)

I think they're assuming the lactate ~~to~~ will be removed in the treatment volume, so it needs to be replenished



**ANDERSON Jim M**

**From:** HAFLEY Dan  
**Sent:** Monday, July 09, 2001 10:13 AM  
**To:** ANDERSON Jim M  
**Cc:** GAINER Tom  
**Subject:** Intel Pilot Lactate Study Work Plan

Jim -

Jim -

I have reviewed the "Pilot Lactate Study Work Plan" completed by IT and HAS for the Intel-Aloha site. My comments are presented below. I don't think all of these necessarily have to be passed on to Intel/IT, but I would be interested in discussing.

*guess its a scoping doc which all we called for in our 5/14/01 mtg*

1. Is this just the "conceptual work plan" for a lactate pilot study, or everything we are going to get prior to implementation. I'm assuming the latter. If it is the latter, It seems a bit lacking in detail.

2. Just out of curiosity, where do we stand on the first IRAM - use of a liquid ring pump to enhance removal of VOCs from site groundwater. I don't recall reviewing the report, but that could be just the new kid thing. Is this technology to replace LRP, or a possible enhancement. *The LRS is what we asked for completely. I think it just an enhancement that may help.*

3. It would be helpful if a figure was included showing the proposed configuration of wells: the 4 injections wells, the center test well, and the downgradient groundwater recovery well. The distinction between the wells is also a bit fuzzy to me, particularly center test well vs. recovery well. It seems like there will be pumping of both.

4. The Pre-Lactate monitoring involves pumping of the test well for 24 hours at 1 gpm to "define water quality conditions". What do they need to pump the well for 24 hours prior to sampling? Are they going to be doing something else such as aquifer testing?

5. The second paragraph of Page 3 refers to a "injection, pumping, and sampling" schedule in Figure 2. I could find no such figure.

6. What is the source of the DO value of 8 mg/L used in the "Lactate Injection Calculation"? I guess this would be considered a very conservative figure and overestimates the amount of lactate that would be needed. *Good catch*

7. I assume that they are proposing an "active" lactate pilot because they want to speed up the pilot testing process, and not because they would plan such a scheme on a site-wide basis. This type of pilot testing is likely more expensive than a "passive" treatment mode of injection of lactate by Geoprobe with downgradient monitoring, with the added complication that "active" and "passive" treatments could have different results (you are stressing aquifer with pumping, potential for preferential pathways, etc.). *True, due to low K.*

8. I would recommend the collection of groundwater chemistry samples, and calculation of an EPA NA screening score, prior to construction of any site wells, to make sure that there is rationale for the test phase, and to get a better sense of what kind of system we may be dealing with (and limitations) before sinking the money into enhanced reductive dechlorination. Perhaps another treatment such as ORC or oxidant injection is more appropriate.

9. What is the basis for their determination that 1gpm pumping will result in removal of one pore volume every 19 days?

