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April 1, 2008

Mr. James Bearzi, Chief
New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303

Dear Mr. Bearzi,

I have personally provided all information from FLUTE to the NMED on our vadose sampling systems. The attached letter sent to Tom Anderson states in the first two sentences that FLUTE is not the source of the 50 ft limit on tubing used in our sampling systems. The rest of the letter explains why that is not a logical conclusion from the experiments performed by Louise Parker and Tom Raney of the US Army Corps of Engineers, which I had sent to Hai Shin in your office. I am concerned that my presentation of materials supporting the use of nylon tubing in our system has been misinterpreted and that the NMED statement made, and often quoted: "NMED contacted the manufacturer who acknowledged that there were problems with VOC adsorption in FLUTE systems greater than 50 feet in length," is a serious misrepresentation of our stated opinion, and I trust that this correspondence will correct this misunderstanding.

In the materials which I sent to Hai Shin, I stated that nylon tubing does absorb TCE to a finite extent as do all polymeric tubing including Teflon tubing which NMED stated was an adequate tubing. Because of the mechanical advantages of Nylon and the lower expense to the customer, we have always used Nylon in our vadose systems. However, we have used PVDF tubing, which is superior to even Teflon in measured TCE absorption (Parker, et al), in all of our water sampling systems since 2002. The main reason for use of PVDF in our water sampling systems is because the flow rate through the tubing is nearly 50 times slower for water than for gas flows. Even for Nylon systems, if the prescribed purge procedures are used, the Nylon tubing absorption is insignificant. That was shown by tests done at Pacific Northwest Laboratories and also at Lawrence Berkley Labs. However, because some customers did not use our prescribed purge procedures, we chose to use PVDF tubing in our water sampling systems to avoid the issue.

I do believe that as the tubing lengths increase with deeper vadose installations that one can reach a depth and associated tubing length where there is a significant absorption with Nylon tubing. In that case, the simple solution is to use PVDF tubing. A recent installation to 600 ft at Los Alamos has both PVDF and Nylon tubing to the same sampling interval for each of ten sampling intervals. The comparison of the contaminant levels in Nylon tubing with that from PVDF tubing from the same sampling interval will be an excellent means of resolving this issue.

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In summary, I take exception to the statement that we believe that vadose sampling in more than 50 ft lengths of Nylon tubing is unreliable. The samples collected in any length of tubing should be judged within the actual conditions of purge volumes and flow rates for the sample collection. This is true for any reliable sampling method. I am happy to discuss the experimental data and our recommended procedures with anyone interested. I called Hai Shin last February and offered to discuss any concerns within the context of available measurements. My phone call was not returned. At best, I suspect that the Corps of Engineers reports that I provided were misunderstood.

I am not trying to defend the Los Alamos environmental program. I am only interested in a reasonable judgment of our technology and its application. We do not perform the measurements, we only recommend the procedure. We expect the use to conform to good scientific practice by the customer. Our multi level systems are used with great satisfaction by the EPA and many other state environmental agencies.

Sincerely yours,

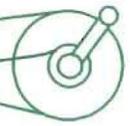


Carl Keller
Principal Scientist

CC: David B. McCoy, Executive Director
Citizen Action New Mexico
POB 4276
Albuquerque, NM 87196-4276

CC: Tom Anderson
SEA

Enclosures: FLUTE letter to Tom Anderson dated 2/26/08



To: Tom Anderson
Subject: Absorption in nylon tubing
Date: Feb. 26, 2008

Dear Tom,

We do not agree that there is excessive absorption in nylon tubing over 50 ft in length. The first statement of the 50 ft limit was in a message sent to you from the NM ED dated Feb. 12. With your flow rates 500cc/min, the residence time in a 100 ft tube is only 0.9 minutes. The 1996 CRREL reports show nylon to be half as absorptive as LDPE. The 1997 CRREL report shows that LDPE absorbs only 2% of the TCE in 1 minute of residence time. Nylon would be expected to absorb only 1% in the same time. The '97 report further states that the residence time is the essential factor in estimating absorption. One percent does not seem to be a significant amount of absorption, nor even ten times that amount when determining the range of TCE transport.

In reviewing our entire exchange of emails on this subject with you and with the NM ED, the main thrust of the information which we provided was that the Nylon tubing should be adequate and that it is used for its mechanical properties. PVDF is better chemically, but lacks the strength of nylon tubing. Nowhere did we imply that 50 ft was the limit for use of nylon. A careful reading of the 1996 and 1997 CRREL reports supports our conclusions. Unfortunately, the CRREL reports are for water flows, but they also show that the longer a flow is maintained in the tubing the less it absorbs.

Regards,

Carl Keller
Principal Scientist