GREAT FALLS
CITIZENS ASSOCIATION

December 1, 2014

Ms. Cynthia Sale,

Environmental Manager, Remediation

Department of Environmental Quality

Northern Regional Office

13901 Crown Court

RE: <u>GFCA Special Committee on Groundwater Contamination</u>

Inactive Fairfax Facility #26140

9901 Georgetown Pike

Great Falls, Virginia

VADEQ PC #2010-3028

Dear Ms. Sale:

The Great Falls Citizens Association hereby submits its comment on the Addendum to the Corrective Action Plan prepared by Kleinfelder East under direction from Fairfax Petroleum Realty, the owner of the former Exxon Station at 9901 Georgetown Pike. We look forward to meeting with DEQ, Mr. Alex Wardle and Mr. Randy Chapman, as well as Kleinfelder, Mark Steele and others, shortly after the December 5, 2014 close of the Comment period for this document. Such a meeting was discussed during the recent public discussion on the Addendum during the GFCA meeting at the Great Falls Public Library on November 11, 2014.

Our principal comments are as follows; technical comments are in the attachment to this letter. These include comments from our Special Committee as well as suggestions to us from outside experts:

1. We believe from the review of the Addendum, that Kleinfelder and Fairfax Petroleum Realty are attempting to justify a minimal cleanup, which is not acceptable to Great Falls. We believe the cleanup can and should be more complete and to lower levels of residual contamination of Methyl Tertiary Butyl Ether (MTBE) than proposed and will be in consonance with the policy of the DEQ, and in consonance with the risk-based decision criteria of the DEQ.

2. Our recommendation is to continue the groundwater pumping from recovery wells on the original site until all the monitoring data on site is below the end point for a period of time. At that time, pump from a monitoring well to the southeast and a monitoring well to the south, near the leading edges of the plume, to more completely recover contamination, until these outer regions are below the end point. We believe this will result in a more rapid and less costly cleanup, and will more effectively remove from our Community a source of much concern to our residents.
3. There should be a single end point used for the entire cleanup, not one for the shallower groundwater and one for the deeper groundwater as proposed, since the groundwater is all interconnected, and because the two proposed end points were not derived using a common methodology and assumptions. The cleanup should also not ignore contamination at any locations, as proposed. Certain questions and irregularities in the derivation of the end point should be explored and resolved in a technical meeting among the parties.

The Great Falls Citizens Association appreciates the cooperation of the Department of Environmental Quality Northern Division, the Fairfax Petroleum Realty, and Kleinfelder East, on this matter of importance to the purity of the well water in the Community of Great Falls, Virginia.

Sincerely,

Great Falls Citizens Association

-Original signed by-

M. Eric Knudsen, President

M.E.K/gs

Cc: next page

Cc: (all by email)

Supervisor John Foust

Cynthia Sale, DEQ Northern Division

Alex Wardle, DEQ Northern DivisionRandy Chapman, DEQ Northern Division

Ralph Lazaro, President, GF Business and Professional Association

Barbara Favola, Virginia Senator

Barbara Comstock, Congresswoman Elect

John Milgrim, Fairfax County Health Department

Matt Tonkin, SS Papadopolus and Associates

Kent Campbell, HP Environmental

GFCA Board and Special Committee

Mr. Ayoub Mamo, Fairfax Petroleum Realty

Mr. Jeffrey Leiter, Fairfax Petroleum Realty

Mr. Mark Steele, Kleinfelder East

Attachment

GFCA OBSERVATIONS AND COMMENTS ON ADDENDUM TO CORRECTIVE ACTION PLAN – December 1, 2014

Comments on Derivation of End Points

1. Kleinfelder used an analytical method suggested by Murray Einarson, of GeoSyntec Consultants of Walnut Creek, California, and Douglas Mackay of the University of Waterloo, Canada, in conjunction with mass flux calculations, to calculate the concentration of MTBE that could occur from the plume, in private wells. The mass flux at transect CC was used to calculate a concentration in private wells to the southeast from the former Exxon Station, and the mass flux at transect DD was used to calculate a concentration in private wells to the south of the Exxon Station.

2. For the analysis to the southeast, Kleinfelder estimates the concentration in a private well would be 0.6 micrograms per liter, which is stated to be below the threshold of detectability for MTBE in water. However, in applying the equation in the Einarson Mackay paper to calculate the dilution in a supply well, Kleinfelder used a value of 2.7 gpm, the sum of 13 private wells in that direction (13 x 0.2 gpm). EPA suggests using 0.2 gpm as an average pumping rate for a private well. However, as clearly shown in the figure of the Einarson paper, a supply well would have to "capture" the plume in order to justify use of 2.7 gpm. However, the private well would be completely surrounded by the plume. Also, near the end of the Einarson/Mackay paper, the situation involving small private wells was discussed, and it indicates that no dilution can be assumed. Thus, the correct concentration in a private well in the southeast would be 13 times 0.6, or 7.8 micrograms per liter. This clearly exceeds the limit of detectability. If we assume a limit of detectability of 1 microgram per liter, as reported in the analytical tables reported by Kleinfelder, the concentration would be 7.8 times the DEQ criteria. Thus, the concentrations in the plume would need to be reduced a factor of 7.8. The concentrations or "end point" in the plume in the southeast direction at the time of the mass flux analysis would need to be reduced from the recommended value of 5000 micrograms per liter, to about 5000/7.8 = 641 micrograms per liter.

3. To the south, Kleinfelder estimates the mass flux, in transect DD, and uses a withdrawal rate of 0.2 gpm for this case, consistent with EPA assumed private well average daily pumping rate, to compute that the concentration would need to be below 474 micrograms per liter, to prevent concentrations in a well to the south from exceeding the non-detect level. The Kleinfelder proposed "end point" for the plume in this direction is therefore proposed as 474 micrograms per liter.

4. However, there is some difficulty apparent in properly calculating a mass flux at transect DD, because the flow is believed to be in discrete deep fractures in a zone that is estimated to be approximately 30 feet wide. Nevertheless, Kleinfelder uses the Mass Flux Toolkit procedure, using data from two shallow wells and one deep well. The difficulty involves the uncertainty in the spatial variation of contaminant, and makes the calculation suspect. The report indicates a fracture was detected in 23D at 91 feet. The horizontal extent of the fracture could be the full 30-foot transect width. The fracture could extend beneath the

maximum depth of monitoring well MW-10 of 40 feet and monitoring well MW-24 of60 feet. There could be additional fractures as in 25D and 26D. The data in the Appendix H does not clearly show the width the fracture penetrated by 23D. If additional deep wells were drilled east of 23D, contamination would be found, would it not? Therefore, the report does not clearly calculate the value of the mass flux at transect DD. We are not convinced of the accuracy of the estimate, and would need a more extensive description to permit acceptance. The hydraulic conductivity also needs to be checked. To the extent there is an error in representing the true situation, there will need to be a corresponding adjustment of the mass flux and resulting necessary end point, to prevent contamination from exceeding the non-detect level of about 1 microgram per liter.

5. The recommendation to use two different end points for so called shallow and deep contamination is technically untenable, since shallow contamination can enter deeper zones, such as when the groundwater redistributes after pumping.

6. The recommendation to ignore the contamination in monitoring well location W1 and W2 on the BF Saul property is untenable, since the figures of concentration profiles clearly show the origin of the contamination was the original Exxon Station, and in any event, is now part of the problem that must be dealt with.

7. The recommendation to ignore the contamination in monitoring well 17D is also untenable. It should be cleaned up to the end point. Alternatively, the well should be reentered and modified to remove the reason for the so-called trapped contamination.

Need for More Robust Cleanup Strategy

8. We are not convinced that the contamination will be effectively drawn from the leading edges of the plume in the southeast and south directions, back to the withdrawal well(s) on the original site of the former Exxon Station. The plume to the southeast clearly is reasonably well delineated by several monitoring wells, and is at or outside the drawdown profiles as depicted. The plume to the south has not been delineated well at all, by the one well at 23D, and could actually be much farther south than 23D. It is true that Kleinfelder has stated the recovery wells tend to draw water from all directions, but it is not clear how effective they will be for these distant points, in a reasonable period of time.

9. The analysis in the Addendum concludes that the single withdrawal well is reducing the MTBE concentrations at 23D, and will reduce it to 474 micrograms per liter in 82 days, is not supported by currently available facts. It is based on the following three samples after the pumping began.

8/20/2014 ---10,000 ug/l

9/3 -----9300

9/22 -----4800

This conclusion is clearly wrong, and it is even more presumptuous, to use the above three points to derive a constant in a logarithmic extrapolation equation. Kleinfelder has

selectively used data and ignored other data, to support an erroneous conclusion.

The earlier data for 23D before the well was activated, is contained in the Kleinfelder report for the second quarter monitoring, and the data is as follows:

5/19/2014 ----8,000 ug/l

6/10 ----11,000

6/19 -----5,100

The average of both sets of concentration data before pumping, and after pumping, is about 8000 ug/l, and so the data on 8/20 and 9/22 cannot support the conclusion that the drawdown is affecting concentrations at 23D. Whether it will reduce the contamination and by how much remains to be determined. A conclusion that could be supported by the currently available data is that the true concentration at 23D varies by about 50% from its average, and has not been affected by the operation of the recovery well. It is also likely that the concentration in the fracture is quite variable. This phenomenon is also interesting and useful, in evaluating the cleanup progress, since it shows that it cannot be assumed that a single data point is representative of the complete situation. Analysis of monitoring data must be done using the statistical rules of evidence.

10. We believe a more effective and timely cleanup strategy is required than the one proposed. When we met with our consultant, he recommended that three recovery wells would be able to better and more efficiently remove the MTBE contamination from the three-lobed plume.

Since there has been operation of a single recovery well for a period of time, the application of the above recommendation can be best implemented as follows: GFCA believes that the recovery well(s) on the former Exxon Station should be operated until the concentrations in all on site wells are below the single end point for perhaps two months of data. Then, two additional submersible pumps should be operated near the leading edges of the plume to the southeast and the south, until the concentrations in all monitoring wells are below the end point. A single end point should be used. The two additional pumps can be connected by above ground hose along the interior road of the Village Center, and by directional drilling and underground hose for the recovery well to the southeast. Alternatively, the portable recovery system trailer could be moved to a location behind the (new) Exxon Station.

11. We agree with the plans to continue monitoring for an extended period of time after the end point is met at all monitoring points, and the requirement that another final public meeting is required prior to closing out the PC.