

44

Analytical Research Division
Research Directorate

26 September 1984

Analysis/Evaluation of Water Samples

A shipment designated 10027X(4) was received by the Analytical Research Division, 10 February 1984, from FSIC. The shipment consisted of seven water samples. One sample, designated 10027X(4)-1, identified with CB840119-1XX, consisted of approximately 3 oz. of water containerized in a narrow neck screw top amber bottle (figure 1). It was taken from a well which had reportedly been poisoned. The second sample, designated 10027X(4)-2, identified with CB840119-2XX, consisted of approximately 3 oz. of water containerized in a narrow neck screw top amber bottle (figure 1). It was taken from a second well which had also reportedly been poisoned. The third sample, designated 10027X(4)-3, identified with CB840130-1DL, consisted of approximately 4 oz. of water containerized in a wide mouth screw top jar (figure 1). This sample was drawn from the same well as 10027X(4)-1 after it had been emptied and put back in use. The fourth sample, designated 10027X(4)-4, identified with CB840130-2DL, consisted of approximately 4 oz. of water containerized in a wide mouth screw top jar (figure 1). This sample was drawn from the same well as 10027X(4)-2 after it had been emptied and put back in use. The other three samples, designated 10027X(4)-5, 10027X(4)-6 and 10027X(4)-7, identified with CB840130-3DL, CB840130-4DL and CB840130-5DL, were reportedly reference samples from nearby wells. Each consisted of approximately 4 oz. of water containerized in a wide mouth screw top jar (figure 1). Due to lack of cushioning, sample 10027X(4)-6 was broken in transit. Approximately 2 ml of the sample was recovered intact and containerized in a glass screw top vial at CRDC. An empty jar was included in the shipment as a reference blank.

Vapor samples withdrawn from within each sample enclosure were subjected to analysis by gas chromatography/mass spectrometry (GC/MS). A portion of each sample was subjected to purge and trap (sparge) MS analysis. Neat samples were analyzed by ion chromatography (IC), thin layer chromatography (TLC), MS for trichothecenes and for determination of pH. Portions of each sample were extracted with chloroform. The extracts were analyzed by TLC and infrared spectrometry (IR).

10027X(4)-1 (CB840119-1XX) well 1 water, poisoned

The GC/MS spectra of the vapor associated with the water identified the presence of traces of phenol. Neither the sparge technique nor the chloroform extract gave a definitive GC/MS spectra. The pH was determined to be 6.5. IC detected 1 ppm fluoride, with no other ions present. No detectable components were separated on either the neat water or the chloroform extract by TLC. Derivatization with negative ion chemical ionization MS detection was negative for trichothecenes. IR spectra identified the presence of trace quantities of aliphatic hydrocarbons and possibly KNO_3 .

Classified by: CIA


Declassify: OADR

10027X(4)-2 (CB840119-2XX) well 2 water, poisoned

The GC/MS spectra of the vapor associated with the water identified the presence of traces of phenol. Neither the sparge technique nor the chloroform extract gave a definitive GC/MS spectra. The pH was determined to be 6.0. IC detected 0.1 ppm fluoride, with no other ions detected. No detectable components were separated from either the neat water or the chloroform extract by TLC. Derivatization with negative ion chemical ionization MS detection was negative for trichothecenes. IR spectra identified the presence of trace quantities of hydrocarbons, possibly silicates as soil and possibly $(\text{NH}_4)_2\text{CO}_3$.

10027X(4)-3 (CB840130-1DL) well 1 water, after cleanup

Neither the vapor associated with the water nor the sparge technique nor the chloroform extract gave a definitive GC/MS spectra. The pH was determined to be 6.5. IC detected 0.2 ppm fluoride, with no other ions detected. No detectable components were separated by TLC. Derivatization with negative ion chemical ionization MS detection was negative for trichothecenes. IR spectra identified the presence of aliphatic hydrocarbons and the possible presence of SiO_2 probably as soil.

10027X(4)-4 (CB840130-2DL) well 2 water, after cleanup

The GC/MS spectra of the vapor associated with the water identified traces of phenol. Neither the sparge technique nor the chloroform solubles gave a definitive GC/MS spectra. The pH was determined to be 6.5. IC detected 0.2 ppm fluoride, with no other ions detected. No detectable components were separated by TLC. Derivatization with negative ion chemical ionization MS detection was negative for trichothecenes. IR spectra identified the presence of traces of aliphatic hydrocarbons and possible traces of soil and phosphate.

10027X(4)-5 (CB840130-3DL) water from reference well

The GC/MS spectra of the vapor associated with the water identified the presence of traces of phenol. The sparge technique gave no definitive GC/MS spectra. Analysis of the chloroform solubles by GC/MS showed only one possible, unidentified component $M/Z = 202$. The pH was determined to be 6.5. IC detected 0.2 ppm fluoride, with no other ions detected. No detectable components were separated by TLC. Derivatization with negative ion chemical ionization MS detection was negative for trichothecenes. IR spectra detected only a trace of aliphatic hydrocarbon.

10027X(4)-6 (CB840130-4DL) water from reference well

This sample was broken in transit. Only vapor sampling and TLC were performed on the recovered water. The analysis data may be due to exposure to packaging contents or be real. The GC/MS spectra of the vapors associated with the water identified the presence of a trace of diphenyl amine. No detectable components were separated by TLC.

10027X(4)-7 (CB840130-5DL) water from reference well

The GC/MS spectra of the vapor associated with the water identified the presence of a trace of phenol. The sparge technique detected SO₂ and an aliphatic hydrocarbon. The chloroform solubles gave no definitive GC/MS spectra. IC detected 0.1 ppm fluoride, with no other ions detected. No detectable components were separated by TLC. Derivatization with negative ion chemical ionization MS detection was negative for trichothecenes. IR spectra identified the presence of aliphatic hydrocarbons and possibly soil.

Conclusion

No evidence of any known CW agents, agent degradation products or trichothecenes was detected. The suspect water contained little or nothing beyond the components of the reference water. The 1 ppm fluoride detected in the first "contaminated" sample is far below a hazardous level. Each of the samples were very slightly acid which is also normal. The suspect samples appear to be innocuous. This does not preclude the possibility of a contaminant having been present at one time and lost through volatilization or dilution prior to sampling.

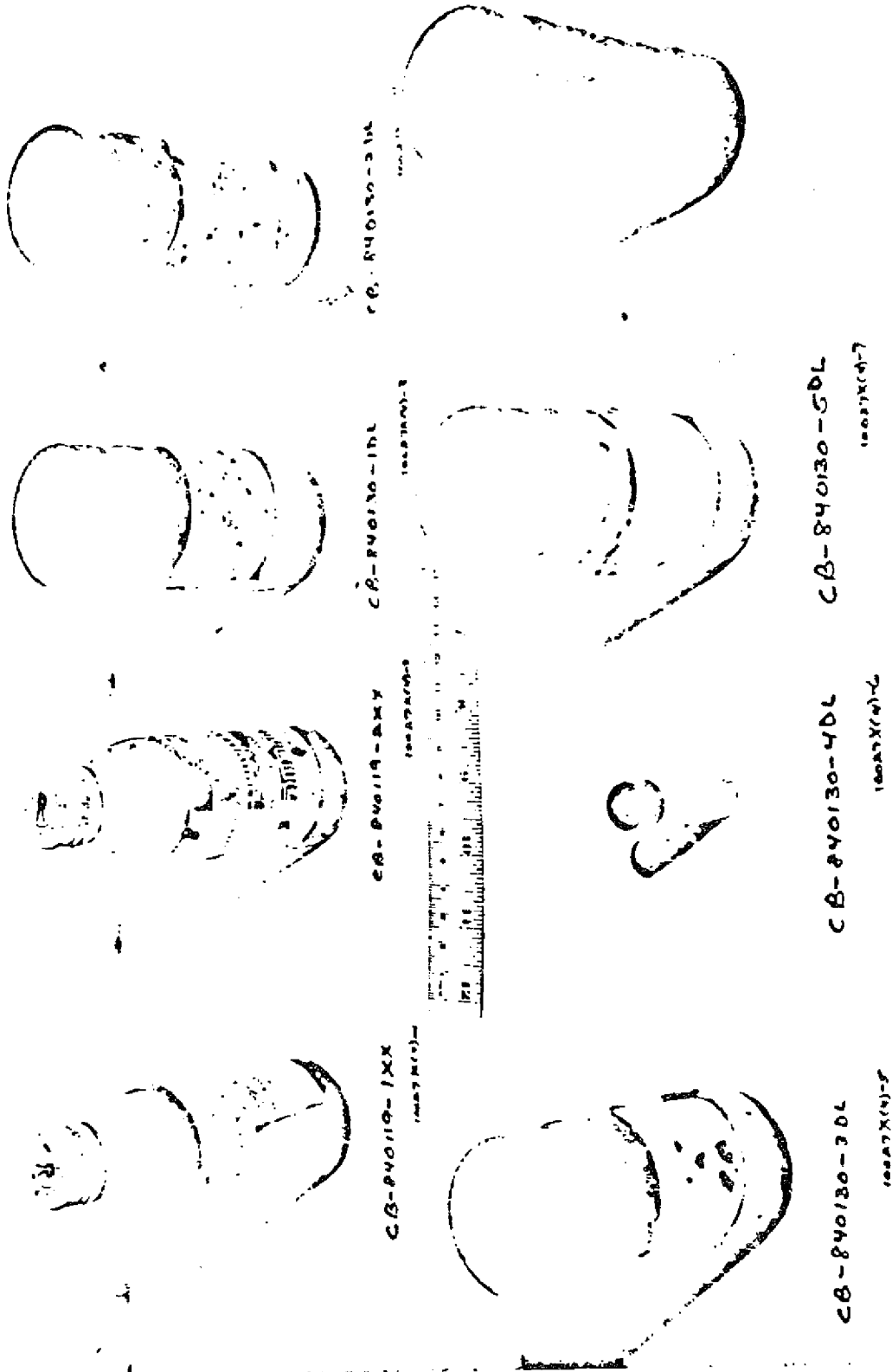


FIGURE 1