DEPARTMENT OF THE AIR FORCE
27TH SPECIAL OPERATIONS CIVIL ENGINEER SQUADRON (AFSOC)
CANNON AIR FORCE BASE NEW MEXICO

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Mr. James Bearzi
Chief Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East Building 1
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FEB 2 5 2008

Dear Mr. Bearzi

Enclosed for your review and records are the final CY 2007 groundwater monitoring and sampling reports for: the annual report for Monitoring Wells A, B, C, D, S, T and U at Landfill (LF) -5, Solid Waste Management Unit (SWMU) 113 and the annual report for Monitoring Wells E, F, G and H at the Sewage Lagoons (SWMU 101) at Cannon Air Force Base (CAFB) taken 23-26 Jul 07. New Mexico Environmental Department (NMED) groundwater standards were used to determine if constituents detected in the monitoring wells exceeded applicable groundwater standards. If the NMED standard for a particular constituent was not available, the United States Environmental Protection Agency (USEPA) groundwater maximum contaminant levels (MCLs), secondary maximum contaminant levels (SMCL's) or USEPA health advisories were applied. In cases where NMED and the USEPA have established separate and different standards for the same constituent, the most stringent standard was applied for purposes of comparison.

The following paragraph is an excerpt from the reports executive summary:

"Concentrations of analytes detected in ground water samples from wells on CAFB are presented in Table 1, 2, 3, and 4 of the attached report. Only concentrations detected above the reporting limits are discussed in this summary and the concentrations are compared with applicable USEPA drinking-water regulations. Arsenic, barium, selenium, sulfate, and vanadium may occur naturally at relatively high reporting limits.

Arsenic was detected in water samples from CAFB-A, B, S, T, and U at concentrations of 5.6 micrograms per Liter (µg/L), 5.0 µg/L, 5.5 µg/L, 5.5 µg/L and 4.8 µg/L, respectively. The USEPA enforceable MCL for arsenic is 10.0 µg/L.

Barium was detected in water samples from all eleven wells at concentrations ranging from 30 µg/L, (CAFB-H) to 94.0 µg/L (CAFB-D). The USEPA enforceable MCL for barium is 2,000 µg/L.

Boron was detected in water samples from all eleven wells at concentrations ranging from 170µg/L (CAFB-A) to 230 µg/L (CAFB-C). There is no National Primary or Secondary Drinking Water Regulation enforceable MCL or recommended SMCL for boron.

Chloride was detected in water samples from all eleven wells at concentrations ranging from 9.0 milligrams/Liter (mg/L) (CAFB-D) to 150 mg/L (CAFB-F). The USEPA recommended SMCL for chloride is 250 mg/L.

Chromium was detected in water samples from all eleven wells at concentrations ranging from 0.75 µg/L (CAFB-D) to 3.7 µg/L (CAFB-T). The USEPA enforceable MCL for chromium is 100 µg/L.

Fluoride was detected in water samples from all eleven wells at concentrations ranging from 1.8 mg/L (CAFB-G) to 2.9 mg/L (CAFB-A). The USEPA enforceable MCL for fluoride is 4.0 mg/L and the USEPA recommended SMCL for fluoride is 2.0 mg/L.

Iron was detected in water samples from CAFB-T and CAFB-U at concentrations of 140.0 µg/L and 120 µg/L, respectively. The USEPA recommended SMCL for iron is 300 µg/L.

Lead was detected in water samples from CAFB-E at a concentration of 7.2 µg/L. The USEPA SMCL goal standard for lead is zero.

Nitrate was detected in water samples from all eleven wells at concentrations ranging from 0.91 µg/L (CAFB-T) to 2.4 µg/L (CAFB-E). The USEPA enforceable MCL for nitrate is 10,000 µg/L.

Perchlorate was detected in water samples from all eleven wells at concentrations ranging from 0.22 µg/L (CAFB-D) to 2.8 µg/L (CAFB-H). There is no Primary or Secondary Drinking-Water Regulation MCL or SMCL for perchlorate. Perchlorate appears on USEPA Drinking Water Contaminant Candidate List, 02 Mar 98, and the USEPA Drinking Water Contaminant Candidate List 2, 02 Apr 04.

Selenium was detected in water samples from CAFB-B, F, H, S, T, and U, at concentrations 6.2 µg/L, 6.3 µg/L, 8.6 µg/L, 7.0 µg/L, 6.5 µg/L, and 6.9 µg/L, respectively. The USEPA enforceable MCL for selenium is 50.0 µg/L.

Sulfate was detected in water samples from all eleven wells at concentrations ranging from 30 µg/L (CAFB-D) to 140 µg/L (CAFB-H). The USEPA recommended SMCL for sulfate is 250 µg/L.

Total Dissolved Solids were detected in water samples from all eleven wells at concentrations ranging from 360 mg/L (CAFB-A and D) to 700 mg/L (CAFB-F). The USEPA recommended SMCL for total dissolved solids is 500 mg/L.

Vanadium was detected in water samples from all eleven wells. Concentrations ranged from 17 µg/L (CAFB-F and G) to 38 µg/L (CAFB-C). There is no National Primary or Secondary Drinking Water Regulation enforceable MCL or recommended SMCL for vanadium.

Zinc was detected in water samples from well CAFB-H at concentration of 24 µg/L. The USEPA recommended SMCL for zinc is 5,000 µg/L.

The results of the CY 2007 long term monitoring sampling events provide no indication that any release from LF-5 nor the Sewage Lagoons has impacted groundwater. If you have any questions, please contact Mr. Jerry Pelfrey at (575) 784-6391.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or person who managed the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sincerely

Michael A. Poston

MICHAEL A. POSTON

Attachment:
RCRA Ground-Water Monitoring for Sewage Lagoons, LF-5 & Perimeter Wells at CAFB, 23-26 Jul 07

cc:
NMED (D. Cobrain)
NMED (C. Frischkorn)
EPA Region VI w/o enclosure (D. Neleigh)
EPA Region VI (B. Sturdivant)

Cannon Air Force Base, New Mexico

RCRA Ground-Water Monitoring at Sewage Lagoons, Landfill 5, and non-RCRA sites

Analytical Results of Samples Collected July 23, 24, 25 and 26, 2007

Prepared for

United States Air Force Air Combat Command
Cannon Air Force Base

November 2007

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Executive Summary

The U.S. Geological Survey (USGS), Water Resources Division, and the U.S. Air Force Combat Command (ACC) have a memorandum of understanding for USGS assistance at any ACC base concerning earth-science, hydrology, or environmental programs. Accordingly, the USGS provides assistance to Cannon Air Force Base (Cannon AFB), an ACC base, in its Resource Conservation and Recovery Act (RCRA) ground-water sampling program. For the July 13, 1990, Compliance Agreement between Cannon AFB and the New Mexico Environment Department (NMED), required ground-water monitoring has been performed by the USGS.

The monitoring network includes wells around Landfill 5 near the southeastern corner of the base, wells around the decommissioned sewage lagoons on the east side of the base, wells adjacent to the playa lake, and wells around the base perimeter (figure 2). Monitoring wells at Landfill 5 are upgradient well A and downgradient wells B, C, D, S, T, and U. The monitoring wells at the sewage lagoons are upgradient well E and downgradient wells F, G, and H. The perimeter monitoring wells include wells V, W, and X, and the Playa Lake monitoring wells include Na, Oa, and Pa.

This report presents water-quality data for samples collected July 23 – 26, 2007. Ground-water samples were collected from 17 monitoring wells; A, B, C, D, S, T, and U near Landfill 5; wells E, F, G, and H near the decommissioned sewage lagoons; wells V, W, and X around the perimeter; and wells Na, Oa, and Pa near the Playa Lake.

Ground-water samples from wells A, B, C, D, S, T, and U were analyzed for volatile organic compounds (method SW8260B); semivolatile organic compounds (method SW8270C); pesticides (method SW8081A); PCBs (method SW8082); herbicides (method SW8151A); dioxins and furans (method SW8280A); perchlorate (SW6860); polynuclear aromatic hydrocarbons (method SW8310); total metals (aluminum, barium, beryllium, boron, calcium, cobalt, copper, iron, potassium, magnesium, manganese, molybdenum, sodium, nickel, silica, strontium, tin, vanadium, and zinc by SW6010B; antimony, arsenic, cadmium, chromium, lead, selenium, silver, and thallium by SW6020; and mercury by SW7470A); and general chemistry [anions including bromide, chloride, fluoride, nitrate, orthophosphate, and sulfate (method MCAWW300.0A); nitrate-nitrite (method MCAWW353.2); total alkalinity (method MCAWW310.1); total cyanide (method MCAWW335.4); total dissolved solids (method MCAWW160.1); total organic carbon (method SW9060); and total organic halogens (method SW9020B)].

Ground-water samples from wells E, F, G, and H were analyzed for volatile organic compounds (method SW8260B); pesticides (method SW8081A); PCBs (method SW8082); perchlorate (SW6860); total metals (aluminum, barium, beryllium, boron, calcium, cobalt, copper, iron, potassium, magnesium, manganese, molybdenum, sodium, nickel, silica, strontium, tin, vanadium, and zinc by SW6010B; antimony, arsenic, cadmium, chromium, lead, selenium, silver, and thallium by SW6020; and mercury by SW7470A); and general chemistry [anions

including bromide, chloride, fluoride, nitrate, orthophosphate, and sulfate (method MCAWW300.0A); nitrate-nitrite (method MCAWW353.2); total alkalinity (method MCAWW310.1); total dissolved solids (method MCAWW160.1); total organic carbon (method SW9060); and total sulfide (method SW9030B/9034)].

Ground-water samples from wells V, W, and X were analyzed for perchlorate (SW6860); total metals (aluminum, barium, beryllium, boron, calcium, cobalt, copper, iron, potassium, magnesium, manganese, molybdenum, sodium, nickel, silica, strontium, tin, vanadium, and zinc by SW6010B; antimony, arsenic, cadmium, chromium, lead, selenium, silver, and thallium by SW6020; and mercury by SW7470A); and general chemistry [anions including bromide, chloride, fluoride, nitrate, orthophosphate, and sulfate (method MCAWW300.0A); nitrate-nitrite (method MCAWW353.2); total alkalinity (method MCAWW310.1); and total dissolved solids (method MCAWW160.1)].

Ground-water samples from wells Na, Oa, and Pa were analyzed for perchlorate (SW6860); total metals (aluminum, barium, beryllium, boron, calcium, cobalt, copper, iron, potassium, magnesium, manganese, molybdenum, sodium, nickel, silica, strontium, tin, vanadium, and zinc by SW6010B; antimony, arsenic, cadmium, chromium, lead, selenium, silver, and thallium by SW6020; and mercury by SW7470A); and general chemistry [anions including bromide, chloride, fluoride, nitrate, orthophosphate, and sulfate (method MCAWW300.0A); nitrate-nitrite (method MCAWW353.2); total alkalinity (method MCAWW310.1); and total dissolved solids (method MCAWW160.1) ; and total kjeldahl nitrogen (method MCAWW351.2)].

Test America in Arvada, Colorado, conducted all laboratory analyses. Concentrations of the analytes detected are presented in tables 1, 2, 3, and 4. The hard copy of these reports has been modified to exclude laboratory information, including analytical results and quality assurance / quality control results. This information is now included only in the CD digital report.

Current altitudes of ground water, measured in all seventeen wells, are shown in figure 2 and historical altitudes of ground water are shown in figure 3.

The U.S. Environmental Protection Agency (USEPA) has established National Primary Drinking Water Regulations – legally enforceable standards, maximum contaminant levels (MCL's), that apply to public water systems. Primary standards protect public health by limiting the levels of contaminants in drinking water. The USEPA also has established National Secondary Drinking Water Regulations; which are non-mandatory, non-enforceable guidelines addressing contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water. The USEPA recommends secondary maximum contaminant levels (SMCL's) for public water systems but does not require compliance to these standards. New Mexico has not adopted SMCL's as enforceable standards. These contaminants are not considered to present a risk to human health at the recommended SMCL.

Significant analytical results from the July 2007 sampling round are listed below:

Aluminum was detected in the water sample from well Oa at a concentration of 120 µg/L. The USEPA recommended SMCL for aluminum is 50 to 200 µg/L.

Arsenic was detected in water samples from wells A, B, S, T and X at concentrations of 5.6 µg/L, 5.0 µg/L, 5.5 µg/L, 5.5 µg/L, and 6.8 µg/L, respectively. The USEPA enforceable MCL for arsenic is 10.0 µg/L.

Barium was detected in water samples from all seventeen wells, ranging in concentrations from 16 µg/L, (well W) to 94 µg/L (well D). The USEPA enforceable MCL for barium is 2,000 µg/L.

Boron was detected in water samples from all seventeens wells. Concentrations ranged from 140 µg/L (well Pa) to 930 µg/L (well W). There is no National Primary or Secondary Drinking Water Regulation enforceable MCL or recommended SMCL for boron.

Chloride was detected in water samples from all seventeen wells at concentrations ranging from 9.0 mg/L (well C) to 230 mg/L (well V). The USEPA recommended SMCL for chloride is 250 mg/L.

Chromium was detected in water samples from wells E, F, G, H, Na, T, and X at concentrations of 3.3, 3.3, 3.3, 2.2, 2.9, 3.7, and 2.9 µg/L, respectively. The USEPA enforceable MCL for chromium is 100 µg/L.

Fluoride was detected in water samples from all wells except well W at concentrations ranging from 1.0 mg/L (well Oa) to 2.9 mg/L (well A). The USEPA enforceable MCL for fluoride is 4.0 mg/L and the USEPA recommended SMCL for fluoride is 2.0 mg/L.

Iron was detected in water samples from wells T, U, and X, at concentrations of 140 µg/L, 120 µg/L, and 160 µg/L. The USEPA recommended SMCL for iron is 300 µg/L.

Lead was detected in the water sample from well E at a concentration of 7.2 µg/L. The USEPA maximum contaminant level goal (SMCLG) standard for lead is zero.

Nitrate was detected in water samples from all seventeen wells at concentrations ranging from 0.90 µg/L (well W) to 7.3 mg/L (well Oa). The USEPA enforceable MCL for nitrate is 10 mg/L.

Perchlorate was detected in water samples from all seventeen wells at concentrations ranging from 0.14 µg/L (well W) to 9.0 µg/L (well V). There is no Primary or Secondary Drinking-Water Regulation MCL or SMCL for perchlorate. Perchlorate, however, appears on the USEPA Drinking Water Contaminant Candidate List published in the

Federal Register on March 2, 1998, and on the USEPA Drinking Water Contaminant Candidate List 2 published in the Federal Register on April 2, 2004.

Selenium was detected in water samples from wells B, F, H, Na, Pa, S, T, U, and V, at concentrations 6.2 µg/L, 6.3 µg/L, 8.6 µg/L, 5.4 µg/L, 7.1 µg/L, 7.0 µg/L, 6.5 µg/L, 6.9 µg/L, and 13 µg/L. The USEPA enforceable MCL for selenium is 50.0 µg/L.

Sulfate was detected in water samples from all seventeen wells at concentrations ranging from 30 mg/L (well D) to 350 mg/L (well W). The USEPA recommended SMCL for sulfate is 250 mg/L.

Strontium was detected in water samples from all seventeen wells. Concentrations ranged from 910 µg/L (well X) to 2,600 µg/L (well V). There is no National Primary or Secondary Drinking Water Regulation enforceable MCL or recommended SMCL for vanadium.

Total Dissolved Solids were detected in water samples from all seventeen wells at concentrations ranging from 310 mg/L (well X) to 1000 mg/L (well Oa). The USEPA recommended SMCL for total dissolved solids is 500 mg/L.

Vanadium was detected in water samples from all seventeen wells except well W. Concentrations ranged from 15 µg/L (well Oa) to 50 µg/L (well X). There is no National Primary or Secondary Drinking Water Regulation enforceable MCL or recommended SMCL for vanadium.

Zinc was detected in the water sample from well H, at a concentration of 24 µg/L. The USEPA recommended SMCL for zinc is 5,000 µg/L.

As part of the quality assurance and quality control (QA/QC) procedures for wells sampled at Cannon AFB, five trip blanks, two field duplicate sample, one equipment blank, and one pair of matrix spike and matrix spike duplicate sample were collected. All the sample cooler temperatures upon receipt by the laboratory were under the EPA's recommendation of 6.0 degrees Celsius.