

UNITED STATES NUCLEAR REGULATORY COMMISSION REGION III

801 WARRENVILLE ROAD LISLE, ILLINOIS 60532-4351

MAY 1 1 1994

MEMORANDUM FOR:

Fuel Facilities and Decommissioning Section Staff

FROM:

George M. McCann, Chief, Fuel Facilities and Decommissioning Section

SUBJECT:

SHIPPING ENVIRONMENTAL SAMPLES FROM SITE TO ORISE OR OFFICE

If you know ahead of time that you will be collecting numerous environmental samples (water, soil, sediment or sludge, etc.) at the site during your inspection, we can now ship them directly to ORISE or the office using our NRC account with Federal Express. You only need one Federal Express shipping paper filled out even if you are shipping more than one box of samples; however, you <u>must</u> prepare your own address labels for each box shipped. Attached is an example of the shipping paper which indicates (circles) the boxes that must be completed. Blank Federal Express shipping forms are available in the Mail Room. As a reminder, if your environmental samples contain biohazards, organic solvents, etc., refer to my memo dated February 11, 1994, for guidance.

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George M. McCann, Chief Fuel Facilities and Decommissioning Section

Attachment: As stated

cc w/attachment: W. L. Axelson G. L. Shear

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EXAMPLE

# PORTAGE COUNTY COMBINED GENERAL HEALTH DISTRICT

Portage County Administration Building 440 South Menaion, 3rd Floor

K. F. RUPP, M.D., F.A.A.F.P. Health Commissioner Ravenna. Ohio 44206 Phone Area Cade 210-200-0010



A/52

August 21, 1987

Field Central Elementary School Attn: Mr. Thomas Shoup, Superintendent 1473 Saxe Road Mogadore, Ohio 44260

Dear Mr. Shoup:

Enclosed are the results of samples taken on July 1, 1987. These results indicate that there is no radiological contamination of your well water. The standard for gross alpha activity is 15 pCi/l and is 50 pCi/l for gross beta activity. All samples taken were well within these limits.

If you have any questions concerning these results please feel free to contact me.

Sincerely,

DuWayne O. Porter, R.S., M.P.H., Director of Environmental Health

DOP/cb

Enclosure

Industrial Chemistry-Se	incline U	nealti	1	Environmental Sample Si	ubmission Report
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Para Total and		P1505, /		DODE, Whi Sampi ug/i	P39365.
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Radium 226 Total coll	,	P75/138,		Methoxychlor, Whi Sampi ug/1	P.39480.
Redium 220, Total pol		P9501,	· .	G Malathion, WhESampl ug/I	P39530.
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Carpon Tetrachloride, Total ug	И	P32102.		Diazinon, Whi Sampi ug/1	P39570.
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Composition of the second seco	ugi	P32101,		PCB. Whi Sampl ug/I	P39516.
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. 2. Uchloroethane. Total ug/l		P32103,		Phonois ug/l	P32730.
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n: 1-Data Processing 2-Central Office 3-District Office 4-Owner 5-Laboratory

1

Exhibit 1 REQUEST FOR TECHNICAL ASSISTANCE (RFTA) INSPECTOR'S NAME DARREL Willephone # (708) 829-9808 FACILITY NAME AND LOCATION GOOdyear DEROSPACE DOCKET NA DATE OF REQUEST 4/7/94 RETA # (LEAVE BLANK) FEE OR NON-FEE RECOVERABLE NON-FEE are. NEARED PROVIDE APPLICATION DATE (FROM LICENSEE) N.A. PLEASE CHECK NEW LICENSE \_\_\_\_ AMENDMENT \_\_\_\_ RENEWAL N.M. SCRIPTION OF WORK TO BE PERFORMED (INCLUDING SCHEDULE) (USE SEPARATE SHEET IF NEEDED) (1) BROSS ALPAN/BETA ON DRIVANY WATER SAMPLE APPROX. Matt Cust: NO D SAMPLEI - If SAMPLEI Show > 15 pC:/2 d 125. 00 / SAMPLE OR > 50 pC:/2 B - do isotepre identification te\* 350.00/SAMPLE (2) The d Sediment SAMPLE (IEAd) for URANIAM FOR CONFIRMATORY SURVEY REQUESTS, PLEASE ANSWER THE FOLLOWING: 1. HAS PRELIMINARY INFORMATION BEEN RECEIVED FROM LICENSEE? YES NO 1A. HAS THIS INFORMATION BEEN REVIEWED BY NRC AND IS IT ACCEPTABLE? (NOTE: ORAU SHOULD BE PROVIDED 30 CALENDAR DAYS TO REVIEW INFORMATION AND PREPARE FOR SURVEY). 2. IS A PRELIMINARY SITE VISIT NEEDED? WHEN? 3. DATE SURVEY PLAN NEEDED 106.06 4. DATE SURVEY NEEDED AUTHORIZATIO by secrety. 24 - 1/7/94 EMERGENCY AUTHORIZATION (SEE INSPECTION CHAPTER 0312 FOR DEFINITION OF ACCEPTABLE EMERGENCY REQUESTS). EXPLAIN, ON SEPARATE SHEET, THE , CMJ. 69 JUSTIFICATION FOR THE EMERGENCY REQUEST. \*NOTE THAT THE REQUEST CANNOT BE PROCESSED WITHOUT THIS JUSTIFICATION. DATE DIVISION APPROVAL DATE HO TAPM HO TM DATE 0312 A 53 Issue Date: 12/31/91 E1-1

# SPRINGFIELD LOCAL SCHOOLS

# BOARD OF EDUCATION

2960 Sanitarium Road

Akron, Ohio 44312

(216) 784-0421

Fax:(216) 784-5838

Dr. Tucker L. Self, Superintendent

Roy B. Swartz, Treasurer

Daniel E. Laskos, Business Manager

February 24, 1994

Dear Parent:

The Springfield Local Schools currently monitors all water supplies to our buildings as required by the Ohio E.P.A. The results of a regular quarterly test recently revealed that a bacteria known as Coliform was present in small amounts in the water supply at Roosevelt Elementary School.

Upon discovery of the bacteria, we were required by the Ohio E.P.A. to retest the water by taking five additional samples. Four of these samples indicated that bacteria was still present in the water. The fifth sample, which was taken at the point where the water enters the building, was negative. Therefore, we know the bacteria is in the water system in the building and not in the well.

We have taken measures to assure that the bacteria does not cause anyone to become ill by turning off all drinking fountains and boiling any water that is used in cooking. Bottled water is being used for drinking purposes. We have treated the water system and expect the next test results to indicate that the water is safe. Until we receive results that indicate the water is safe, we will not allow anyone to drink the water or use it in cooking. Be assured that bottled water will continue to be available for drinking, and we will continue to boil any water used in cooking. We anticipate the problem to be corrected and the water safe by early next week.

A statement concerning our water testing policy and a statement about any illness that may be related to this bacteria is included on the back of this letter.

If you have any questions, please do not hesitate to call the superintendent's office.

Sincerely.

Tucker L. Sélf, Ph.D., Superintendent

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#### SCOPING SURVEY PLAN

#### Licensee: Goodyear Aerospace Corporation

Advanced Technology Center

Akron, Ohio

License No.: SNM-1461, Docket No. 070-01489 (terminated)

Inspection Dates: 4/25-29 1994

Inspector(s): D. G. Wiedeman

Accompaniment: Ohio Department of Health and OEPA were notified of the

inspection, however, informed that due to circumstances were not invited to

accompany the inspectors.

<u>Purpose of Inspection</u>: To perform a scoping survey to determine the identity of potential radioactive contaminants and the general extent of residual activity present on building surfaces, grounds and off-site residential areas.

I. Determine radionuclides used at the facility DONE 4/11/94Licensee was authorized for 349 grams of uranium-235 contained in a maximum of 46.00 kg of total uranium (includes normal, depleted and enriched uranium in any form). The last two inspection reports indicate that material was UF<sub>6</sub> in 50 Lb. containers which were received from DOE.

#### Background Information

AEC issued License No. SNM-1461 to Goodyear on January 14, 1974 (Part 2 of the application contained DOE "Secret-RD" information) for research and development of uranium enrichment equipment (gas centrifuge). Handling of radioactive materials involved the use of uranium hexafluoride (UF,) in 50 lb. cylinders, which would be piped into experimental centrifuges used to test different rotor designs. The centrifuges were located in a pit area in a blimp hanger (No.91), buildings 85 and 90 were also associated with the operations. The centrifuge process produced both depleted and enriched uranium (U-235). The licensee monitored air and water effluents from the Wingfoot facility during this research from 1974-1985. Previous NRC inspections in 1979 and 1982 indicated that the licensee did not have a defined survey program for contamination control. The licensee's air sampling results within the Wingfoot facility were at background levels except for two incidents in 1980 and 1981 where high readings were noted as a result of spills in the "cut up" and mass spectrometer areas of the facility. The licensee's air sampling and liquid effluent data for areas outside the Wingfoot facility showed no abnormal levels from 1974 to 1985. The licensee performed a close-out survey of the facility and requested termination of the license on January 16, 1985. The NRC requested ORAU to perform a confirmatory survey which was conducted May through August 1986. The first two surveys identified areas contaminated above the NRC release criteria, the third and final survey concluded that all areas of contamination have been identified and ORAU performed a confirmatory survey in June and August, 1986, however,

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the NRC did not confirm that these areas were properly remediated. The areas in question are the following: (1) elevated floor activity in the decontamination area and UF, storage area, {alpha/beta/gamma levels of 16K and 113K dpm/100cm<sup>2</sup> near a support beam and alpha levels of 13-196K dpm/100cm<sup>2</sup> near a sink} (2) isolated and general areas of contamination found in the main process area and high-bay, {water collected from the sink drain (grid block K54) contained gross alpha 94 pCi/l and gross beta 81 pCi/l, and the sewer line was contaminated with uranium.

#### Inspection Objectives

Confirm that the following areas were decontaminated to a residual radiation level consistent with current NRC release criteria: See Attachment B, Grid Blocks E50, E52, G50, F48, H54, I54, J52, J54, E48, F50, I52, K53 and K54, (2) determine the termination point of floor drains in Building 91, e.g., municipal sewerage system, leach field, holding tanks, dump directly into Wingfoot lake etc., (3) using EPA and ORISE collection protocols, sample three on-site monitoring wells to determine gross alpha and beta levels to determine if sub surface contamination exists, (4) collect and analyze four shore line sediment samples around Wingfoot lake to determine deposition of uranium in the lake, (5) using EPA and ORISE collection protocols sample 6 off-site residential wells to determine if possibility exists that drinking water is contaminated with uranium from former licensed activities, (5) on a sampling basis, perform direct radiation survey of off-site homes and/or yards if the property owner requests a survey, take soil sample of any area that exceeds 3X background.

- A. Review file to determine use areas DONE 4/11/94
  - B. Interview previous or current employees
- II. Determine affected and unaffected areas DONE 4/11/94
  - A. Affected areas DONE 4/11/94
    - 1. Areas that have the potential for contamination based on a

review of the license and interviews DONE 4/11/94

- B. Potencial Areas Done 4/12/94
  - 1. Areas immediately adjacent to affected areas DONE 4/11/94

C. Unaffected areas

All remaining areas not classified as affected or

potentially affected areas DONE 4/11/94

- III. Determine survey instruments and efficiency DONE, See Attachment C
  - A. If only a few nuclides used, determine efficiency for all nuclides
  - B. If numerous nuclides used NA
    - 1. Determine efficiency of predominately used radionuclides or
    - 2. Determine efficiency based on nuclide present in analyzed samples. DONE, Victoreen Model 190 w/15cm<sup>2</sup> pancake probe used for beta+gamma measurements, Ludlum Model 19 microR meter used for gamma measurements, Eberline ESP alpha meter with 59cm<sup>2</sup> probe used for alpha measurements, Attachment C.

IV. Survey

- A. Survey will include floors, drains, pipes, ducts, cracks, lower walls, and outside areas adjacent to buildings
   1.(b) Determine if sewer or building drains exist (maps or pictures and/or discussion with Goodyear employees.
  - Affected areas, conduct a 100 % walk-over using 2 meter wide lanes
  - Potential areas, conduct a 50 % walk-over using 2 meter wide lanes
  - Unaffected areas, conduct a 25 % walk-over using 2 meter wide lanes
- B. Collect smears at each location of elevated measurements or randomly, if no elevated measurements  $Apart \frac{1}{2r-26}/91$
- C. Collect samples of residues or surfaces with elevated measurements
  - 1. If samples potentially contaminated with biological or chemical hazardous materials, contact RIII office for Nowe instructions on sampling a shipping

- D. Document survey results and locations of elevated readings with enough detail to be able to relocate  $-\int unc \frac{y}{2(-26/99)}$ 
  - 1. Reference to predominant landmarks
- V. Contamination Identified
  - A. Collect appropriate information to determine area of elevated measurements
  - B. Analyze samples collected in RIII lab to identify radionuclides
    - 1. Determine instrument efficiency AONE
    - 2. Determine activity of elevated measurements
      - Greater than maximum guideline criteria, remediation required.
      - b. Greater than average, but less than maximum guideline criteria, need to determine contamination level averaged over one square meter. Use NUREG/CR 5849 area weighted formula to determine average level.
      - c. Area weighted average greater than average guideline criteria, remediation required NOTE- During this inspection soil/sediment samples from around Wingfoot Lake will be taken and/or at any discharge point to determine Uranium soil concentrations. This inspection will include a review of other potential for liquid run-off, standing water or potential collection points, old sewers, septic areas. Soil samples will be collected if direct radiation levels exceed 3X background. - None fermed

**Burial Sites** VI.

- Determine if facility had onsite burials DONE 4/11/94 A.
  - Review files to determine if onsite burials authorized DONE 1. Interview previous or present employees - April 4/25-26/94
    - 2.
- Conduct a 100 % walk-over exposure rate surveys using 2 meter wide Β. lanes
- Generally, if the possibility of subsurface contamination or С. burials exist, additional sampling and surveying will be required. This is generally performed during the characterization survey. Soil limits taken from Branch Technical Position 35 pCi/g (1.3Bq) Depleted Uranium, 30 pCi/g (1.11Bq) enriched uranium. Water samples will be analyzed by ORISE and the results will be compared to the EPA drinking water standards, Attachment D...

Use "Checklist for Conducting Assessment of Site Radiological Status", page 3.6 NUREG/CR 5849, Attachment A.

Additional Inspection activities which will be considered if applicable: 1. Take photographs of site and off-site sampling locations. - Not AUNE

AN HO SAMPLES & firl Sample Sent to ORISE Vie Fed. EXPRESS ON 4/26#27 SEE Alached "Chain of Casadady" Recards

# Checklist for Conducting Assessment of Site Radiological Status

DONE 1.

Review license operating records, documentation supporting license amendment applications, and other pertinent documents.

June 12.

Discuss site history with senior and former employees and others who may have information on past operations.

DONE 3. Identify radionuclides used.

DONE 4. Determine which radionuclides could be site contaminants.

5. Identify locations of likely residual activity.

DONE

Perform scoping survey.

DONE 7. Identify specific radionuclides at site.

Establish guideline values; develop site-specific values.

DONE 8.

Compare scoping survey findings with guideline values.

 Prepare Inspection report identifying locations of contamination (if any).

REVIEWED BY: 4 McCanh, Chief,

Fuel Facilities and Decommissioning Section

APPROVED BY:

Gary 12. Shear, Chief Fuel Cycle and Decommissioning Branch



ATTACHMENT A

# Checklist for Conducting Assessment of Site Radiological Status

- DONE 1. Review license operating records, documentation supporting license amendment applications, and other pertinent documents.
- Discuss site history with senior and former employees and others who may have information on past operations.
- DONE 3. Identify radionuclides used.
- DONE 4. Determine which radionuclides could be site contaminants.
- DONE 5. Identify locations of likely residual activity.
- Perform scoping survey.
- DONE 7. Identify specific radionuclides at site.
- DONE 8. Establish guideline values; develop site-specific values.
- Compare scoping survey findings with guideline values.
  - 10. Prepare Inspection report identifying locations of contamination (if any).

REVIEWED BY:

G M. McCann, Chief, date Fuel Facilities and Decommissioning Section

APPROVED BY:

Gary L. Shear, Chief Fuel Cycle and Decommissioning Branch date



ATTACHMENT A Page 1 of 1 Pages



PONMLKJIHGFEDCBA

FIGURE 5: Grid System Established for Survey Reference















METERS





#### CALIBRATION SOURCES

Sr-Y-90 93,600 dpm

Th-230 8,860 dpm

## INSTRUMENT CHECK

Eberline ESP Alpha (Th-230 source shows 1,200 cpm (14% eff) (Bkg.1-7 cpm) 2,100 cpm= ~15,000 dpm {alpha}

(Sr-Y-90 source shows ≈10 cpm

NRC Tag No. 033845, Calibrated 6/27/93Probe 59 cm<sup>2</sup>

Victoreen 190 (Sr-Y-90 source shows 30,000 cpm (32% eff) (Bkg.40 cpm) ~5,000 cpm= 15,000 dpm {beta} {uranium max. limit} ~1,666 cpm= 3,000 dpm {beta} {thorium max. limit}

NRC Tag No. 040520, Calibrated 7/28/93 Probe pancake 15 cm<sup>2</sup>

Ludlum Model 19 micro-R meter NRC Tag No. 015522 Calibrated 7/93 7-10 µR/hour- background



ATTACHMENT C Page Lot Pages EPA Proposed Drinking Water Standards

In a notice of proposed rules dated 7/18/91, EPA is proposing Maximum Contaminant Level Goals (MCLG's) and National Primary Drinking Water Regulations for Rn-222, Ra-226, Ra-228, uranium, alpha emitters, beta and photon emitters. The MCLG's are intended to be nonenforceable health goals based upon health effects and exposure information. Proposed Maximum Contaminant Levels (MCL's) are enforceable standards which the Safety Drinking Water Act directs the EPA to set as close to the MCLG's (zero) as is feasible. The proposal also describes monitoring, reporting and public notification requirements for the radioactive contaminants.

The following are the proposed MCL's for each source; the estimated numbers of people exposed to the levels above each MCL appear in parentheses:

Radium-226, 20 pCi/l (890,000) Radium-228, 20 pCi/l (246,000) Uranium, 30 pCi/l (875,000) Gross Alpha 15 pCi/l (500.000) Beta/Photon 4 mrem ede/year  $50 pC_{1}$ 

The EPA proposes that the MCL for Radon be set at 300 pCi/l, based upon an estimated transfer factor of radon from water to air of 10,000 to 1.

Reverse osmosis is considered to be the overall best method for reducing contaminant levels of the nuclides addressed in this proposed rulemaking. Other technologies include ion exchange, lime softening, coagulation/filtration, and mixed ion exchange.

PAGE / of / pages

## POTABLE (DRINKING) WATER

It is very important that extreme care be taken when collecting potable water. By definition, the public will be involved in the collection of such samples and a poorly collected sample can affect the public's perception of the entire environmental monitoring program.

When collecting from wells the latter must be purged of 3 - 5 volumes of the standing water in the well. As a rule, this may take 30 minutes. At a minimum, the nearest domestically used well downgradient from the surface discharge point should be sampled. The NRC recommends sampling 1 to 3 of the nearest water supplies likely to be affected. One background sample from a control (upgradient) location is all that is required.

When collecting water from the tap: the tap should be directly connected to a main water line, it should not be connected to a storage tank; the tap should not be too close to the sink bottom or the ground (this reduces the possibility of contamination from the outside of the tap of the ground from getting into the sample); avoid leaking taps; only sample taps with steady flow; remove aerators and strainers prior to sampling; and allow the cold water tap to run at least 2 - 3 minutes prior to sampling. Note: the majority of these suggestions are primarily of importance when the bacterial content of the water is being analyzed.



# SAMPLE FILTRATION AND PRESERVATION

## 1. Filtration

In order to evaluate the risk associated with contaminants in the water supply, it is necessary to distinguish between the soluble and suspended contaminants. Water samples are generally filtered as soon after collection as possible. This will invariably be done employing vacuum filtration or pressure driven filtration. This requires a hand operated pump, a battery operated pump or a pump with generator.

The most widely used filter is perhaps the 0.45 um pore size membrane filter. Very small particulates do pass through such a filter so the distinction between suspended and dissolved contaminants is arbitrary. These filters can quickly clog but they are not as bad as polycarbonate filters which should be avoided. With extremely dirty water it may be necessary to prefilter with a cellulose filter.

When filters are handled, wear gloves. Filter holders and sample lines should be cleaned between samples. When possible, the filtration system should first be rinsed with an aliquot of the sample.

The use of disposable filter cartridges is convenient but it is possible these filters may remove some dissolved solutes by adsorption.

## 2. Preservation

The purpose of preservation is to prevent changes in the sample between the time of collection and analysis. While these preservatives can be quite effective, sample analysis should proceed as soon as possible.

The major things to be achieved by preservation are: the prevention of bacterial, algal or fungal growth (these organisms can selectively remove various materials from solution); the prevention of metals from precipitating out of solution; and preventing material from volatilizing. Obviously, the preservation technique will depend on the material of interest.

Perhaps the best way to prevent bacterial, algal or fungal growth is to keep the sample in the dark and refrigerate to 4 °C. Other methods include the addition of Hg  $Cl_2$  or  $H_2$  SO.

To keep metals (most radionuclides) in solution and prevent precipitation, acidification is used. Samples are acidified to a pH<2 with HNO<sub>3</sub> or HCL. This can usually be accomplished by the addition of 10 mls of concentrated acid to one gallon of sample.

The addition of NaOH to the sample to increase the pH to 9-12 can help prevent volatilization of certain compounds. Note, for some common radionuclides eg. H-3 and

I-131 no chemical preservation will be employed. For I-131 analysis needs to be performed within a few days of collection.

# 3. Sample Containers

For most samples either glass or plastic containers may be used. However, for the analysis of radionuclides, plastic (polyethylene) containers are generally preferred. They are certainly more convenient; they are cheaper, lighter, and not prone to breakage or slippage. Plastic containers should not, however, be used when tritium analysis will be required.

The following tables provide the EPA recommendations, as well as those other organizations, for sample preservation.

Analyte	Method of Preservation	Holding Time
Gross Alpha, Beta, and Gamma	Acidify to 0.5N HC1.	1 Year
Ase, Np, Pa	Acidify to 0.5N EC1.	1 Year
Ba-140, Ca-137	Acidify to 0.5N EC1.	Decays
Ce-141, Ce-144	Acidify to 0.5N ENO, or 0.5N EC1.	Decays
Co-58, Co-60	Acidify to 0.5N EC1.	Decay* (Co-58) 1 Year (Co-60)
1-131	None.	7 Days
Fe-55	Acidify to 0.5N EC1.	1 Year
Fe-54	Acidify to 0.5N EC1 or 0.5N ENOs.	Decaye
Pb-210, Mn-54, Ru-103, Ru-106	Acidify to 0.5N EC1 or 0.5N ENO <sub>s</sub> .	1 Year
Po-210	Acidify to 0.5N ENO,.	Decay*
Ra-236	Noze.	1 Year
la-228	Add HCl to pE (1.5.	1 Year
1-89, Sr-90	Acidify to 0.5N EC1 or 0.5N ED40,.	1 Tear

Preservation of Radionuclides (Thatcher and others, 1977)

"Rapid decay and/or daughter in-growth is the limitation on holding time. Preservation of Metal and Nutrient Jons (U.S. Geological Survey, 1977)

Analyte	a thad of D	
	thou of Preservation	Holding Time
Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Li, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, SO4	Add HNO, to pH <2.	6 Months
B*, Br, C1, F, SiO <sub>3</sub>	None.	6 Months
Ηg	Add HNO, to pH <2.	Analyze As Soon As Possible
N Species (NO <sub>5</sub> , NO <sub>2</sub> , NH <sub>5</sub> )	Best - Store at 4°C. Acceptable - Add 40 mg/1 HgCl <sub>2</sub> , then cool to 4°C.	24 Hours 7 Days
P Species (PO <sub>4</sub> , organics, etc.)	Best - Store at 4°C. Acceptable - Add H <sub>2</sub> SO <sub>4</sub> to pH <2 and cool to 4°C, or add 40 mg/1 HgCl <sub>2</sub> and cool to 4°C.	24 Hours 7 Days
Sulfide	Add 2 ml of 2N zinc acetate per liter of sample; neutralize with alkali if needed.	Analyze As Soon As Possible
Ti	Add $ENO_3$ to $pE < 2$ , then add 3 ml $E_3SO_4$ .	6 Months
Th, U	Acidify to 0.5N EC1.	1 Year
3Hee	None.	Indefinite

\*Store in polyethy lene or boron-free glass. \*\*Samples for \*H analysis must be stored in glass with a tritium seal cap.

31

#### SECTION 8.4

## WATER SAMPLING

#### 1.0 PURPOSE

To describe the procedure for collecting samples of water from surface and subsurface sources

## 2.0 <u>RESPONSIBILITIES</u>

- 2.1 The site coordinator is responsible for assuring that this procedure is implemented.
- 2.2 Survey team personnel are responsible for following this procedure.

## 3.0 EQUIPMENT

- 3.1 Bailing implement: Borehole bailer ORISE design, cup, can, pail, or other appropriate device.
- 3.2 Submersible, vacuum, or peristaltic pump with power source.
- 3.3 Four liter plastic container, storage boxes and tags, or other container type as applicable.
- 3.4 Funnel.
- 3.5 Large Erlenmeyer Flask with two-hole stopper.
- 3.6 Tygon tubing.
- 3.7 Labels and security seals.
- 3.8 Indelibie pen.
- 3.9 Record forms and/or logbook.
- 3.10 Cleaning supplies, as appropriate (see Section 10).

Survey Procedures Manual ORISE/ESSAP Approved:

Project Manager

Revision No. 8 Date: December 31, 1993 Page 11 of 27 Sec. 8

ORISE PROducel

## 4.0 PROCEDURE

- 4.1 Surface Sample
  - 4.1.1 Dip water carefully from the selected location, being careful to avoid collection of bottom sediment or vegetation.
  - 4.1.2 Using a funnel, transfer the water into a container.
  - 4.1.3 Collect a total of 3.8 liters of sample.
  - 4.1.4 Cap the container tightly. NO PRESERVATIVES (NITRIC ACLD) ARE NECESSARY
  - 4.1.5 Label and secure the sample in accordance with Section 8.9 and the chain-of-custody procedure in the Quality Assurance Manual. Record pertinent information on the Chain-of-Custody Form (Figure B-19, or equivalent).
  - 4.1.6 The container should be placed in a cardboard box (also properly labeled) for better storage.
  - 4.1.7 Record pertinent data on the Miscellaneous Sample Record Form (Figure B-15, or equivalent) and/or site logbook.
  - 4.1.8 Clean collecting equipment, as appropriate before proceeding with additional sampling (see Section 10).
- 4.2 Subsurface (well or borehole) Sample (Option 1)
  - 4.2.1 Lower the bailer apparatus into the borehole or other sub-surface source of water.
  - 4.2.2 Allow water to flow into the bailer (use care to avoid buildup of sediments on the bailer diaphragm, which could prevent the diaphragm from sealing).

Survey Procedures Manual ORISE/ESSAP Approved:

Project Manage

Revision No. 8 Date: December 31, 1993 Page <u>12</u> of <u>27</u> Sec. <u>8</u> 4.2.3 Retrieve the bailer and empty contents through a funnel into a container.

4.2.4 Repeat procedure until 3.8 liters of sample has been collected.

4.2.5 Repeat steps 4.1.4 through 4.1.8.

Subsurface Sample (Option 2) 4.3

4.3.1 Lower the inlet end of tubing until it contacts the water surface.

4.3.2 Start pump and collect water in large flask.

4.3.3 Empty flask into container as necessary.

4.3.4 Repeat until 3.8 liters of sample has been collected.

4.3.5 Repeat steps 4.1.4 through 4.1.8.

Survey Procedures Manual ORISE/ESSAP Approved:

Project Manager

Revision No. 8 Date: December 31, 1993 Page 13 of 27 Sec. 8

NRC FORM 303 (RIII) U. S. NUCLEAR REGULATORY COMMISSION LABORATORY USE ONLY (3-83) **REQUEST FOR ANALYSIS** CONTROL NUMBER REGION III LABORATORY SAMPLE LOCATION (LICENSEE) LICENSE NO. DOCKET NO FROSPALE FOODVEAR SNM-1461 070-01489 SAMPLE SUBMITTED # TOTAL TYPE DATE SAMPLES SUBMITTED PRIORITY Soil/Sed.ment ROUTINE URGENT \*\*\* for Removable Contam. SAMPLE COLLECTION INTERVAL SMEMR MONT DAY YEAR TIME 94 START INSPECTOR RESPONSIBLE TELEPHONE NUMBER D. WiedEMAN/W. SNELL STOP 9808 LIST DESIRED LIST DESIRED ANALYSIS TO BE PERFORMED OTHER TYPE OF ANALYSIS (Specify) LLD (Optional) LLD (Optional) GROSS ALPHA (GA) 1.000 dAA IDEXA GROSS BETA (GB) GAMMA SPEC (GS) Soil-Sedment TEHTOM (H3) () WA ferloo Road Sed ment CARBON-14 (C14) (2)LEACH Filld-S.E. pipt IODINE 125 (1125) REMARKS 3)04+fall # 2 1,000 da m/ ON SMEAR Look for REMOVABLE URANIUM/4-NA 1. NRICHEL oild Sediment Look for U-NAJ ENR: che Epond Results in Sm pei an NAdaral 4 is the Limi GM pci DED/ELEV 7ng 30 000 DEOVE NOTE- LILENSEE WAS Lon NOTE: SAMPLES WILL BE DISCARDED AFTER ANALYSIS UNLESS REASONS ARE NOTED IN REMARKS ABOVE. \*\*\* FOR URGENT USE ONLY -- Signature blocks below must be completed by the Inspector's appropriate Section Chief and by the Chief, Effluents Radiation Protection Section BEFORE submitting this form to the Region III Laboratory SIGNATURE - APPROPRIATE NUCLEAR MATERIALS SAFETY SECTION CHIEF DATE DATE SIGNATURE - FUEL FACILITIES AND CONTAMINATED SITES SECTION

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#### WINGFOOT LAKE FACILITY 8-9-94

#### FUEL CELL TEST FACILITY

• DURING TESTING, 20 MILLIMETER AND SMALLER AMMO WAS FIRED AT FUEL TANKS TO TEST THEIR CAPACITY TO MINIMIZE FIRE/EXPLOSIONS. THE TANKS -- USED ON AIRCRAFT DURING THE VIETNAM WAR -- WERE DESIGNED TO SELF-SEAL, IN ORDER TO SAVE LIVES.

# UNDERGROUND FUEL TANK - 10.000 GALLON REUSABLE FUEL

 FUEL USED IN TESTS OF PORTABLE MILITARY FUEL TANKS FOR DESIGN/SAFETY IMPROVEMENTS.

- AFTER USE FUEL WAS SOLD FOR ENERGY VALUE.
- THREE MONITORING WELLS MEET DRINKING WATER STANDARDS.
- THE FOURTH WELL, MW-3, INDICATES A LEVEL OF 120 PARTS PER BILLION OF BENZENE.
- MINUTE AMOUNT OF FUEL IN SHALLOW GROUNDWATER.
- SITUATION BELIEVED TO BE LOCALIZED GROUNDWATER FLOWS SOUTHEAST.
- CONTAMINATION IS BELIEVED TO HE LOCALIZED.
- · GOODYEAR WORKING WITH THE OHIO EPA TO ASSESS AND CLEAN UP THE SITE.
- SIGNIFICANT DATES
  - 1986 TANK REMOVAL
  - 1989 FACILITY CLOSED
  - 1990, FEB. OHIO EPA CLOSURE SUBMITTAL
  - 1990, SEPT. OHIO EPA COMMENTS
  - 1991, MAY GOODYEAR MODIFICATIONS
  - 1991, JUNE SITE ASSESSMENT STARTED
  - 1991. JULY INTERIM REPORT SUBMITTED
  - 1992, JAN. EXPANDED SITE INVESTIGATION
  - 1992, MAY OHIO EPA REQUEST FOR SAMPLING
  - 1992, JULY AMENDED CLOSURE SUBMITTED
  - 1993, JAN. AMENDED PLAN PUBLIC NOTICE

1994, AUGUST - OHIO EPA COMMENTS-PENDING

#### AMMUNITION DUMP

THE "AMMUNITION DUMP" WAS A TEMPORARY <u>STORAGE</u> SHED FOR AMMO. AT THE TIME, THE WORD "DUMP" WAS A MILITARY TERM USED TO DEFINE A TEMPORARY STORAGE AREA.

- NO ENVIRONMENTAL PROBLEMS ARE ASSOCIATED WITH THE EMPTY STORAGE SHED.
- ALL AMMUNITION WAS REMOVED FROM TEMPORARY STORAGE IN 1980.
- IN 1993, PROPOSALS WERE OBTAINED TO REMOVE THE BUILDING IN THE NEAR FUTURE.
- THE BUILDING REMAINS EMPTY AND ENCLOSED BY AN EIGHT FOOT HIGH SECURITY FENCE.
- · EXISTING SHED LOCATED 1000 YARDS FROM THE FUEL TEST AREA.

# UNDERWATER ACOUSTIC TEST FACILITY

- SYSTEM WAS OPERATIONAL IN THE SPRING OF 1982.
- DISH SHAPED EXCAVATION 35 FEET DEEP 100 FEET DIAMETER
- DREDGE & FILL PERMITS OBTAINED FROM CORPS OF ENGINEERS WHICH REQUIRED PROCEDURES THAT PREVENTED SOIL PARTICLES FROM ENTERING THE MAIN LAKE.
- THE PRODUCT A NAVY TRAINING AID WAS A 20 FOOT LONG/ 21 INCH DIAMETER DEVICE, WHICH CREATED SONAR SIGNALS USING ITS INTERNAL ELECTRONICS TO SIMULATED A FULL-SIZE ENEMY SUBMARINE.
- DURING TESTS. THE PRODUCT NEVER WAS DETACHED FROM THE HOIST, WHICH TETHERED THE PRODUCT IN THE WATER UNDER THE FACILITY.
- NO EXPLOSIVES, CHEMICALS OR RADIATION ASSOCIATED WITH TESTS.
- · NO CONTAMINATION ONLY SONAR (SOUND WAVES) EMPLOYED.

#### THE CENTRIFUGE PIT

- THE CENTRIFUGE PIT WAS 30 FEET IN DIAMETER AND 53 FEET DEEP.
- FOLLOWING CANCELLATION OF THE GOVERNMENT CONTRACT AND A SITE STUDY, THE NRC INDICATED IN 1986 THAT THE AREA COULD BE UTILIZED FOR UNRESTRICTED USE.
- THE AIRSHIP PROGRAM REQUIRED ADDITIONAL FLOOR SPACE. DETERIORATING GRATING OVER THE PIT PRESENTED A QUALITY-CONTROL ISSUE/SAFETY HAZARD. FLOOR REPLACEMENT OVER THE PIT WAS SCHEDULED.
- PROPOSALS WERE OBTAINED AND A CONTRACT SIGNED. HOWEVER, THE PROJECT WAS DELAYED UNTIL THE NRC COMPLETED ITS STUDY AND GAVE VERBAL ASSURANCE THAT NO PROBLEMS EXISTED. THE NRC FOLLOWED WITH A WRITTEN REPORT.

LEACH FIELD

- THE LEACH FIELD -- LOCATED NORTHEAST OF THE HANGAR BUILDING -- IS AN INTEGRAL PART OF THE SEWAGE TREATMENT PLANT.
- THE SEWAGE TREATMENT PLANT HAS AN OHIO EPA WASTEWATER DISCHARGE PERMIT. REGULAR MONITORING IS PERFORMED IN ACCORDANCE WITH OHIO EPA REQUIREMENTS.
- THE LEACH FIELD SEPARATES SOLIDS FROM THE WASTEWATER. THE SOLIDS WERE SAMPLED BY THE NRC.

## LAKE MANAGEMENT

- . WINGFOOT LAKE IS A SHALLOW LAKE -- AROUND 6-8 FEET IN DEPTH.
- IT IS VERY SUSCEPTIBLE TO AGING OR EUTROPHICATION UNLESS PROPERLY MANAGED TO MAINTAIN OXYGEN LEVELS AND WEED/ALGAE GROWTH.
- GOODYEAR HAS EMPLOYED A LAKE MANAGEMENT PROFESSIONAL FOR OVER 20 YEARS.
- A FISH KILL OCCURRED CIRCA 1984 IN THE BACK LAKE FEEDING THE MAIN LAKE DUE TO A HEAVY-SNOW COVER THAT PREVENTED SUNLIGHT FROM PENETRATING AND PROVIDING PLANT GROWTH. THE MAIN LAKE WASN'T AS ADVERSELY EFFECTED AS THE BACK LAKE.
- THE LAKE IS PERIODICALLY RESTOCKED WITH SELECTIVE FISH (SUCH AS NORTHERN PIKE) INTRODUCED TO HELP BALANCE THE BLUEGILL FISH POPULATION.
- IN THE EARLY EIGHTIES, THE LAKE WATER LEVEL WAS LOWERED TO HELP RESTORE THE LAKE BALANCE BY REMOVING SEDIMENT AND ROTTING VEGETATION.
- THE CURRENT PROGRAM TO MAINTAIN THE LIFE OF THE LAKE INCLUDES AERATORS AND AMUR FISH.
  - GOODYEAR INSTALLED 12 COMPRESSORS TO PROVIDE OXYGEN
  - GOODYEAR INTRODUCED OVER 4000 AMUR FISH INTO THE LAKE
    - TO CONTROL PLANT AND ALGAE GROWTH.

OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

OR

May 19, 1994

Mr. Darrel Wiedeman U.S. Nuclear Regulatory Commission Region III 801 Warrenville Road Lisle, IL 60532-4351

## SUBJECT: DATA RESULTS FOR SAMPLES FROM VICINITY PROPERTIES TO GOODYEAR AEROSPACE, AKRON, OHIO (RFTA 94-018)

Dear Mr. Wiedeman:

Attached are the results of gross alpha/beta analyses, performed on nine water samples from vicinity properties to the Goodyear Aerospace facility in Akron, Ohio. Gross alpha and gross beta activities were less than 15 pCi/l and 50 pCi/l, respectively, for each water sample.

Uranium concentrations in the fish sample from Wingfoot Lake were < 0.6 pCi/g for U-238 and < 0.1 pCi/g for U-235 (wet weight).

If you have any questions regarding this data, please contact me at (615) 576-3740 or Michele Landis at (615) 576-2908.

Sincerely,

Ein W. abelguit

Eric W. Abelquist Project Leader Environmental Survey and Site Assessment Program

EWA:ttc

Attachment

cc: T. Mo, NRC/NMSS, 4E4 D. Tiktinsky, NRC/NMSS, 6E6 J. Beck, ESSAP J. Berger, ESSAP M. Landis, ESSAP PMDA, NRC/6E6 File/253

P.O. BOX 117, OAK RIDGE, TENNESSEE 37831-0117

Managed and operated by Oak Ridge Associated Universities for the U.S. Department of Energy

Sample	Dissolved Solids		Filtered Solids	
Number	Gross Alpha (pCi/l)	Gross Beta (pCi/l)	Gross Alpha (pCi/l)	Gross Beta (pCi/l)
NRC 37001	< 1.7	< 1.8	$2.8 \pm 0.5^{a}$	5.1 ± 0.6
NRC 37002	< 6.4	< 6.8	< 0.5	$1.0 \pm 0.5$
NRC 37003	<4.2	< 5.0	< 0.5	< 0.7
NRC 37004	<2.4	6.8 ± 1.4	< 0.5	< 0.7
NRC 37077	< 4.2	< 3.7	< 0.5	< 0.7
NRC 37078	1.6	3.1 ± 1.1	< 0.5	< 0.7
NRC 37079	< 2.1	< 2.4	< 0.5	< 0.7
NRC 37080	< 6.5	< 6.9	< 0.5	< 0.7
NRC 37081	< 3.4	< 2.9	< 0.5	< 0.7

# GROSS ALPHA/BETA ACTIVITIES IN WATER GOODYEAR AEROSPACE AKRON, OHIO

"Uncertainties represent the 95% confidence level, based only on counting statistics.

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ID: ORISE - SAP

FAX:615-241-3497

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May 19, 1994

Mr. Darrel Wiedeman U.S. Nuclear Regulatory Commission Region III 801 Warrenville Road Lisle, IL 60532-4351

#### DATA RESULTS FOR SAMPLES FROM VICINITY PROPERTIES TO SUBJECT: GOODYEAR AEROSPACE, AKRON, OHIO (RFTA 94-018)

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Uranium concentrations in the fish samples . Wingfoot Lake were 5.0.6 peing for U-288 and < 0.1 DCi/e for U-235 (wet weight).

If you have any questions regarding this data, please contact me at (615) 576-3740 or Michele Landis at (613) 576-2908.

Sincerely,

En W. abulguit

Eric W. Abelguist Project Leader Environmental Survey and Site Assessment Program

EWA:ttc

Attachment

T. MO, NRC/NMSS, 4E4 CC: D. Tiktinsky, NRC/NMSS, 6E6 J. Beck, ESSAP J. Berger, ESSAP M. Landis, ESSAP PMDA, NRC/6E6 File/253

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GROSS	ALPHA/BETA ACTIVITIES IN WATER	
	GOODYEAR AEROSPACE	
	AKRON, OIVIO	

	Dissolved Solids		Filtered	Solids
Sample Number	Gross Alpha (pCi/l)	Gross Beta (pCi/l)	Gross Alpha (pCi/l)	Gross Beta (µCi/l)
NRC 37001	<1.7	<1.8	2.8 ± 0.5"	5.1 ± 0.6
NRC 37002	< 6.4	< 6.8	< 0.5	1.0 ± 0.5
NRC 37003	< 4.2	< 5.0	< 0.5	< 0.7
NRC 37004	<2.4	6.8 ± 1.4	< 0.5	< 0.7
NRC 37077	<4.2	<3.7	< 0.5	< 0.7
NRC 37078	<1.6	$3.1 \pm 1.1$	< 0.5	< 0.7
NRC 37079	<2.1	<2.4	< 0.5	< 0.7
NRC 37080	< 6.5	< 6.9	< 0.5	< 0.7
NRC 37081	< 3.4	< 2.9	< 0.5	< 0.7

\*Uncertainties represent the 95% confidence level, based only on counting statistics.

b: lessap lotters wiedensan 006

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JUE 1 5 1994

The Goodyear Tire and Rubber Co. ATTN: Joe L. Holtshouser, Manager Industrial Health Management Services 1144 East Market Street Akron, OH 44316 License No. SNM-1461(terminated) Docket No. 070-01489(terminated)

Dear Mr. Holtshouser:

SUBJECT: INSPECTION OF FORMER NUCLEAR REGULATORY COMMISSION (NRC) LICENSED SITE AND SURROUNDING ENVIRONS (NRC REPORT NO. 999-90003/94040(DRSS))

This refers to the special inspection conducted by Messrs. D. G. Wiedeman, W. Sneil and K. Andre of this office from April 25 through July 8, 1994, of Building 91 at the Goodyear Wingfoot Lake Advanced Technology Center, Portage County, Ohio and the surrounding environment. This inspection was in response to concerns from local residents in Suffield and Portage Counties and the NRC's review of the terminated NRC License files. Licensed activities were previously authorized by NRC Special Nuclear Material License No. SNM-1461. The results of our preliminary findings were discussed with members of your staff at the conclusion of the on-site inspections on April 26, June 22, and July 8, 1994.

The enclosed copy of our inspection report identifies areas examined during the inspection. The inspection consisted of a selective examination of representative records from the former license file, observations, independent measurements, and interviews with employees of Goodyear, Goodyear's contractor, Loral, concerned citizens residing in Portage and Suffield counties and local school officials from Springfield and Field School Districts.

Based upon this inspection, we concluded that licensed material covered under NRC Special Nuclear Material License No. SNM-1461 was properly transferred during the period 1975-1985 to the U. S. Department of Energy and all nonrecoverable materials were transferred to Teledyne Isotopes for disposal. The facilities in Building 91 (blimp hanger) were decontaminated to a residual radiation level consistent with current NRC guidelines. The NRC criteria are described in a document titled "Guidelines for Decontamination of Facilities and Equipment prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material," dated August 1987. This inspection also included an assessment of off-site areas to determine the potential for radiological environmental contamination. Based on that assessment, we concluded that there was no uranium in the areas surrounding the Goodyear Wingfoot Facility in excess of the NRC unrestricted release limits. Consequently, we have no further questions regarding this matter.

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· PLEASE RETURN TO:

Darrel Wiedeman NRC REGION III Nuclear Materials Inspection Branch

Allel

The Goodyear Tire and Rubber Co.

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#### 111 1 5 1994

In accordance with 10 CFR 2.790 of the Commission's regulations, a copy of this letter and the enclosure to this letter will be placed in the NRC Public Document Room.

We will gladly discuss any questions you have concerning the inspection.

Sincerely,

# al Signed by Gary L Shear

Gary L. Shear, Chief Fuel Cycle and Decommissioning Branch

Enclosure: Inspection Report No. 999-90003/94040(DRSS)

- cc w/enclosure:
- R. Owen, Ohio Department of Health
- M. Nelson, M.D. Summit Co. Health District
- R. Beals, Ohio Environmental Protection Agency
- J. Wentz, U.S. Environmental Protection Agency, RV
- J. McCourt, Senator Metzenbaum's Office

bcc w/enclosure: PUBLIC (IE07) D. Funk, RIII



#### U.S. NUCLEAR REGULATORY COMMISSION

#### REGION III

Report No. 999-90003/94040(DRSS)

License No. SNM-1461 (terminated) Docket No. 070-01489 (terminated)

- Licensee Goodyear Aerospace Corporation Akron, Ohio 44315
- Inspection At: Goodyear Tire and Rubber Company Wingfoot Lake Advanced Technology Center Blimp Hangar No. 91 Portage County, Ohio --and-residential homes, churches and schools located in Portage, Springfield and Summit Counties, Ohio

Inspection Conducted: April 25-July 8, 1994

W.G. Snell

Inspectors:

D. G. Wiedeman Senior Health Physicist

07/15/924 Date

7/15/94 Date

W. G. Snell Senior Health Physicist

Approved By:

Sur n.

G. M. McCann, Chief / Fuel Facilities and Decommissioning Section

#### Inspection Summary

<u>Inspection on April 25-July 8, 1994 (Report No. 999-90003/94040(DRSS))</u> <u>Areas Inspected</u>: This was a special inspection to review the former licensee's activities and to determine if licensed materials were properly transferred to an authorized recipient and buildings used under the former NRC license were properly decontaminated prior to the termination of the license. The inspectors conducted an independent review of transfer records and performed radiation surveys in the licensee's building that was used for research and testing. This inspection also included an assessment of the off-site (unrestricted) areas to determine the potential for radiological environmental contamination.

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<u>Results</u>: All licensed materials possessed under NRC License No. SNM-1461 were properly transferred to the U.S. Department of Energy during the period 1975-1985 and all unrecoverable material was transferred to Teledyne Isotopes for disposal. All buildings and facilities formerly covered under the license were free of residual contamination. The results of all off-site water, soil, sediment and fish sample analyses showed that levels of uranium (U-238, U-235, and U-234) were below the NRC unrestricted release criteria.

#### 1. Persons Contacted

- \* Harry Weaver, Maintenance, Goodyear Tire and Rubber Company (GT&RC)
- \* Joseph Smerglia, Principal Engineer, GT&RC
- \* Edward Puhala, Industrial Hygiene Consultant, GT&RC
- \* Thomas Riley, Manager of Airship Operations, Wingfoot Facility, GT&RC
- ★ ≈25 employees from Loral, Goodyear contractor, Wingfoot Facility, GT&RC
- # Joe Holtshouser, Manager, Industrial Health Management Services Daniel Laskos, Business Manager, Springfield Local Schools, Akron, Ohio

Tucker Self, Superintendent of Schools, Springfield Local Schools

- C. Maurice Oatley, Assistant Superintendent of Schools, Field Local School District
- @ Michael Bolas, Project Coordinator, Ohio Environmental Protection Agency (OEPA)
- @ Rodney Beals, Environmental Manager, OEPA
- Louise Fabeniski, U.S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry (ATSDR)
- @ J. Wentz, U.S. Environmental Protection Agency, Region V
- Ø Janice McCourt, Office of Senator Metzenbaum, Ohio
- @ Tammy Proctor, Photojournalist, Hartville News, Hartville, Ohio
- @ Concerned citizens from Summit and Portage Counties, Ohio
- @ Martha Nelson, M.D., Health Commissioner, Summit County Health District
- & Robert Hofer, Industrial Hygienist, Goodyear
- & Todd Struttmann, Sharp and Associates, (Goodyear Contractor, Fuel Test Facility)
- \* Attended the exit meeting conducted on April 26, 1994.
- # Telephone conversation on May 19, 1994, regarding the results of laboratory analysis of samples collected at the time of the inspection.
- @ Attended meeting at Summit County Health District Office on April 29, 1994.

& Attended the exit meeting conducted on June 22, 1994.

#### 2. Background

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The Atomic Energy Commission (AEC) issued License No. SNM-1461 to Goodyear Aerospace on January 14, 1974, (Part 2 of the application contained DOE "Secret-RD" information) for research and development of uranium enrichment equipment (gas centrifuge). Handling of radioactive materials involved the use of uranium hexafluoride (UF<sub>6</sub>) in 50 lb. cylinders, which would be piped into experimental centrifuges used to test different rotor designs. The centrifuges were located in a pit area in a blimp hanger (No. 91). Buildings 85 and 90 were also associated with the operations. The centrifuge process produced both depleted and enriched uranium (U-235). All licensed material was procured from the U.S. Department of Energy (DOE) and upon completion of the experiment, the enriched and depleted uranium was transferred back to DOE. The licensee monitored air and water effluents from the Wingfoot facility during this research from 1974-1985.

Previous NRC inspections in 1979 and 1982 verified that no effluent or airborne releases of radioactive materials either on-site or off-site exceeded the NRC limits. The licensee performed a close-out survey of the facility and requested termination of the license on January 16, 1985. The NRC requested its contractor, Oak Ridge Associated Universities (ORAU), to perform a confirmatory survey which was conducted from May through August 1986. The first two surveys identified areas within the facility which were contaminated above the NRC release criteria, the third and final survey concluded that all areas of contamination had been identified. ORAU performed final confirmatory surveys in June and August 1986. The areas identified as exceeding the release criteria during the first two surveys were found to have been remediated to below the NRC release limits.

#### Independent Measurements

Independent radiation surveys were performed with a Victoreen Model 190 portable survey instrument with a Model RP-1 pancake probe, NRC Tag No. 040608, and Ludlum Model 19, NRC Tag No. 015522, calibrated on February 14, 1994 and July 28, 1993, respectively. Prior to the surveys all instruments were checked for accuracy and constancy with dedicated and traceable check sources. All instruments responded as expected.

Comparative background radiation measurements were taken in the downtown area of Akron, Ohio with the Victoreen Model 190 and Ludlum Model 19 portable survey instruments. Background measured 45-55 counts per minute (cpm) with the Victoreen and 7-15 microroentgens per hour ( $\mu$ R/h) {1.8-3.8 nanocoulomb per kilogram per hour (nC/kg/h)} with the Ludlum.

The inspectors conducted radiation surveys in and around selected areas in blimp hanger No. 91 which included: Grid blocks B-80 through P-80+. (See Attachment A for grid block locations.) All five floors of the underground shielded structure that once housed the centrifuge unit were also surveyed. The areas surveyed included hallways, offices, former research and storage areas, former research laboratories and areas outside the building. The NRC inspectors' survey of the above referenced rooms, buildings and adjacent property did not identify any radiation levels that exceeded the NRC release criteria. Three areas of fixed contamination were identified in Grid Blocks G-52, H-56 and P-28. All of these areas of contamination were below the NRC unrestricted release criteria of 15,000 disintegrations per minute (dpm), with the highest reading at 400 cpm (1200 dpm). The NRC release criteria is contained in the NRC Guidance Directive FC 83-23, "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material", revised August 1987.

Radiation surveys were conducted along the roadways of Waterloo Road to Summit to Sanitarium to Route 224. No radiation levels above natural background were identified. Additional radiation surveys were conducted in a residential home on Hutchison Drive in Suffield, Ohio. The surveys included the basement, living room, bedroom and kitchen. These surveys did not identify any radiation levels above natural background. The inspectors also conducted a radiation survey in the garden of the property owner and did not identify any radiation levels above natural background.

#### 4. Environmental Sampling

#### Wingfoot Lake Water

A four liter sample of lake water was collected following EPA collection protocols. This sample was analyzed by an NRC contractor, Oak Ridge Institute for Science and Education (ORISE). See Table 1 for laboratory results.

#### Monitoring Well

A four liter sample of water was collected following EPA and ORISE collection protocols from a 16 foot monitoring well on the south side of Wingfoot Lake Road on the Goodyear Fuel Test Facility site. This sample was analyzed by ORISE. See Table 1 for laboratory results.

#### Well Water

Ten four-liter samples were collected from deep and shallow wells in and around the Wingfoot Lake Advanced Technology Center following EPA and ORISE collection protocols. One of these samples was from a 160 foot well at the Goodyear facility and the other nine were from residential drinking water wells. These samples were analyzed by ORISE. See Table 1 for laboratory results.

#### Soi1

Six soil samples were collected. Two samples identified as "Outfall" were taken from the discharge point of all storm water from blimp hanger No. 91 where it empties into Wingfoot Lake. Two samples identified as "Leach Field" were taken at the lowest discharge point for all sewerage discharges from blimp hanger No. 91. Two samples identified as "Spillway" were collected at the Wingfoot Lake discharge point near Waterloo Road as it enters the Fox ditch. See Table 2 for laboratory results.

#### Fish from Wingfoot Lake

On April 26, 1994 a fish was captured in a net in Wingfoot Lake to be used as an indicator of the levels of uranium in the sediment and water in the lake. The fish was split with Goodyear for independent analysis, with the NRC's portion of the fish shipped to ORISE for analysis. However, due to problems during laboratory preparation, the final quality assurance check showed the results to be unacceptable. Therefore, on June 22, 1994, two additional fish were captured in a net in Wingfoot Lake and shipped to ORISE for analysis. The results of the fish analysis indicated uranium levels of  $3.84 \pm 0.27$  picocuries per kilogram (pCi/kg) {142 ± 10 millibecquerels per kilogram (mBq/kg)} U-234, 0.42 ± 0.01 pCi/kg (15.5 ± 0.4 mBq/kg) U-235, and 8.76 ± 0.41 pCi/kg (324 ± 15 mBq/kg) U-238.

#### Sediment

Five sediment samples were collected from Wingfoot Lake. Three samples were collected offshore from where the soil samples were collected. The other two samples were collected from locations in the middle of the lake. See Table 2 for laboratory results.

#### 5. Laboratory Analysis

#### Smear Tests

Smear tests for removable activity were taken at one location where direct readings indicated levels of radiation below the NRC release criteria but in excess of background measurements. This smear test was analyzed in the Region III laboratory. The smear test was analyzed for gross alpha and gross beta activity. Results of the laboratory analysis for the smear test indicated that the contamination was not removable.

Conclusion: The contamination identified was below the NRC release levels for fixed contamination.

#### Water Samples

Twelve (12) water samples were collected during the inspections, which included the following: Wingfoot Lake, a 160 foot well and a 16 foot monitoring well located at the Wingfoot facility, and nine (9) residential drinking water samples from local homes which included both municipal water and private shallow wells. Table 1 below provides the results of the laboratory analysis of those samples.

IMDLE I: Maler Milalysis	TABLE	1:	Water	Analy	ysis	
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Control	ontrol		Gross alpha/beta <sup>(1)</sup> pCi per liter	
No.	Location	Observations	alpha	beta
37078	Wingfoot Lake	cloudy,contained biological material	<1.6	3.1±1.1
37077	Deep well,160'deep Wingfoot	clear, no odors	<4.2	<3.7
37080	Residential Well,Hutchinson Rd. Suffield	clear, no odors	<6.5	<6.9
37079	Residential Well, Wingfoot Rd., Suffield	35' deep well,cîear, sulfur odor	<2.1	.2.4
37081	Residential municipal water, Cuyahoga Falls	municipal water, clear, no odors	<3.4	<2.9
37001	Church Well, State Route 43, Suffield	clear, sulfur odor	<1.7	<1.8
37002	Residential Well, Goodyear Park Blvd., Suffield	clear, sulfur odor, evidence of high iron content	<6.4	<6.8
37003	Residential Well, Mishler Rd., Suffield	≈ 50' deep well, clear, sulfur odor, treated with softener	<4.2	<5.0
37004	Residential Well, Bey Road, Akron	≈ 35' deep well, clear, no odor	<2.4	6.8±1.4

Control			Gr alph pCi p	ross na/beta <sup>(1)</sup> per liter
NO.	Location	Observations	alpha	beta
00001	Residential Well, Glenview Dr., Suffield	clear, no odor	<2.2	19.7±2.0
00002	Residential Well, Glenview Dr., Suffield	clear, no odor	<2.6	5.9±1.8
7734	Monitoring Well MW-3	≈ 16' monitoring well, cloudy, benzene odor	<3.3	<4.0

<sup>(1)</sup>The U.S. EPA (National Interim Primary Drinking Water Regulations) limit is 15 pCi/liter gross alpha and 50 pCi/liter gross beta and total uranium should not exceed 30 picocuries per liter.

Conclusion: The NRC concludes that because none of the above water samples exceeded the U.S. EPA National Primary Drinking Water Regulations, the shallow and deep aquifers in and around the Goodyear Wingfoot Advanced Technology Center are not contaminated with radioactive material as a result of former NRC licensed activities at the Goodyear Wingfoot facility.

Soil

Six soil samples were collected and analyzed. The results of those analyses are shown in Table 2. The NRC release criteria for soil/sludge is described in the October 23, 1981 Federal Register, Branch Technical Position "Disposal or Onsite Storage of Thorium and Uranium Wastes from Past Operations". These limits are:

m natural uranium (U-238 plus U-234): 10 pCi/g
depleted uranium: 35 pCi/g
m enriched uranium: 30 pCi/g

Conclusion: The NRC concludes that the soil samples do not exceed the NRC release criteria and the uranium concentrations found in the samples are within the range normally found in environmental soil samples.

Sample No.	Sample Identification	uranium-234 pCi/g	uranium-235 pCi/g	uranium-238 pCi/g
001	Outfall #1	<1.0	<1.0	<1.0
002	Outfall #2	<1.0	<1.0	<1.0
003	Leach Field #1	<1.0	<1.0	<1.0
004	Leach Field #2	<1.0	<1.0	<1.0
005	Spillway #1	<1.0	<1.0	<1.0
006	Spillway #2	<1.0	<1.0	<1.0
007	Sediment #1	<1.0	ND <sup>(2)</sup>	<1.0
008	Sediment #2	<1.2	ND <sup>(2)</sup>	<1.2
009	Sediment #3	<1.0	ND <sup>(2)</sup>	<1.0
010	Sediment #4	<1.0	ND <sup>(2)</sup>	<1.0
011	Sediment #5	<1.0	ND <sup>(2)</sup>	<1.0

Table 2: Soil/Sediment Analysis<sup>(1)</sup>

<sup>(1)</sup>The average uranium concentration in U.S. soils is approximately 1.0 pCi/g (1.5 parts per million (ppm)). Higher levels of uranium are found in the surface soils of such areas as the Colorado Plateau, lands affected by phosphate tailings in Florida, and the Reading Prong in northeastern Pernsylvania. The world average concentration of uranium ranges from 0.2 to 2.0 pCi/g (0.3-3.0 ppm). (National Cour.il on Radiation Protection, NCRP Report No. 94, 1987)

(2) None Detected

#### Fish and Sediment Samples

Two fish were prepared and analyzed for uranium. Because of the very low levels of uranium normally found in fish, a three day alpha spectrometry count was conducted. In reviewing the results of the fish sample, two issues were raised. The first was that based on our search of available scientific literature, we were unable to find acceptable data with which to compare our results. This resulted in our inability to reasonably assess the significance of the results. The second issue was when we compared the activities from U-238, U-235, and U-234 with each other, the contribution from U-234 appeared low. Because we could not explain the apparently low level of U-234, and due to the lack of comparable data, it was decided that the fish sample alone provided inconclusive evidence as to the level of uranium in Wingfoot Lake. Therefore, to provide a better assessment of the levels of uranium in the lake, on July 8, 1994, five sediment samples were taken from Wingfoot Lake. The results of the sediment samples are shown in Table 2.

**Conclusion:** The NRC concludes that the sediment samples do not exceed the NRC release criteria and the uranium concentrations found in the samples are within the range normally found in environmental soil samples.

#### 6. Overall Conclusion

Based on our review of documentation and sample results, it is our conclusion that there is no uranium in excess of NRC release limits in the Goodyear Wingfoot Facility or the nearsite environment from the previously licensed activities conducted at that facility.

#### 7. Exit Meeting

The NRC inspectors conducted exit meetings at the conclusion of the inspections with the individuals identified in Section 1 of this report and summarized the findings of the inspection. The inspectors informed the former licensee that it appeared that all licensed material formerly licensed under NRC Special Nuclear Material License No. SNM-1461 had been properly transferred prior to the termination of the license, and all remaining buildings used for licensed activities had been properly decommissioned. During the exit meetings, none of the inspection findings or documents provided to the inspectors were considered proprietary.

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In a letter to the U.S. Nuclear Regulatory Commission dated March 3, 1994, you expressed concerns that the past use of radioactive material at the Goodyear Wingfoot Lake Advanced Technology Center may be related to health problems experienced by you and your family. As a result of your concerns we conducted a special inspection of activities conducted at the Goodyear's Wingfoot facility authorized under an NRC license between 1974 and 1985. The results of our inspection are attached (Attachment 1).

In letters dated June 9 and June 17, 1994, you raised additional concerns in regard to our inspection activities at the Goodyear facility. We have addressed each of the concerns in Attachments 2 and 3. In addition, during an April 29, 1994 meeting, you provided a petition to NRC representatives in attendance which requested we conduct comprehensive testing for radiation in your communities.

Our recent inspection activities, conducted between April and July 1994, included a review of past NRC inspection reports, a review of confirmatory surveys conducted for the NRC in 1986 by the Oak Ridge Associated Universities (ORAU), and the collection and analysis of numerous environmental samples. Our selection of environmental samples focused on those areas where the likelihood of finding radioactive contamination existed.

Based on the results of our inspection and the results of the sample analyses, we found no evidence that radioactive contamination in excess of the NRC unrestricted release limits exists at the Goodyear Wingfoot facility or in the nearsite environment. As a result of this finding, we are concluding our investigations of this matter.

In your June 17 letter, you requested that someone from the NRC travel to Akron to help you interpret NRC material obtained through your Freedom of Information Act (FOIA) request. If you have questions regarding documents you obtained from the NRC, or questions related to our policies or regulations, you may submit your questions to us in writing and we will provide you a written response as soon as possible.

JUL 1 5 1994

If you have any questions regarding the report or our response to your concerns, please contact Mr. Mike McCann at (708) 829-9856.

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Sincerely,

Original Signed by Gary L. Shea.

Gary L. Shear, Chief Fuel Cycle and Decommissioning Branch

Attachments: As stated

bcc w/attachments: D. Funk, RIII

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RIII GLS Shear 07/15/94

#### ATTACHMENT 2

#### Response to June 9, 1994 Letter

#### \* The monitoring wells at the Wingfoot facility should be sampled.

One monitoring well was sampled on June 22, 1994. Only one of four wells was sampled due to their close proximity to one another. A monitoring well sample was not obtained during our April 1994 inspection because we were not aware that any monitoring wells existed.

Based on our inspection findings, the NRC has no basis to believe that licensable materials were used in such a manner as to contaminate the soil or groundwater. However, in light of citizens concerns, we collected several types of environmental samples from a variety of locations. These samples were collected to determine if any indication of licensable material existed in the environment. Results of sample analysis have indicated that no licensable material has been found that exceeds the NRC release limits. If indications were found that such materials existed, then further analysis would be considered.

We performed the following sampling:

- Nine water samples randomly selected from residences around the Goodyear facility.
- One water sample from Wingfoot Lake.
- c. One water sample from a 160 foot well located at the Goodyear facility.
- One water sample from a 16 foot monitoring well at the Goodyear facility.
- e. Two soil samples from the discharge point of Wingfoot Lake into the Fox ditch.
- f. Two soil samples from the Goodyear facility sanitary sewage system leach field.
- g. Two soil samples from the outfall into Wingfoot Lake of the Goodyear facilities Blimp Hanger No. 91 storm water drain.

h. Three fish from Wingfoot Lake. One fish was originally caught and sent for analysis, but the sample was inadvertently cross-contaminated during laboratory sample preparation rendering it unusable.

 Five sediment samples from various locations in Wingfoot Lake. odyear personnel misled the NRC when they indicated there were no monitoring wells at the Wingfoot facility.

We do not believe there was any intent to mislead the NRC. We believe the Goodyear personnel questioned at the time of the inspection were either unaware of the monitoring wells or misunderstood the question. The existing four monitoring wells that were later identified by the EPA were specifically installed to monitor contamination from jet fuel and were not associated with monitoring for radioactive contamination.

\* Soil samples were taken from an area that had been remediated.

The area that was remediated by removing two feet of soil and replacing it with clean fill was where the jet fuel contamination occurred. We took no soil samples there because no activities involving the licensed material took place at that location.

\* The leach bed that was sampled was 1/2 mile away.

The leach field was where the old sewer line drained. Because this area had never been remediated, it was an excellent area to sample for radioactive contamination from potential liquid discharges.

\* Request that the NRC test where the old sewer line was located.

The old sewer line was located under the concrete floor of Blimp Hanger No. 91. The concrete floor was cut out above the line, the old sewer removed, the hole filled in and the concrete floor replaced during remediation of the facility. In June and August of 1986, the Oak Ridge Associated Universities (ORAU), under contract with the NRC, conducted confirmatory surveys for the NRC of the remediation efforts by Goodyear at the Wingfoot facility. ORAU's final report, issued in September 1986, stated that followup scans, including soil samples from the area excavated in conjunction with removal of the sewer line, indicated no residual areas of contamination. Since surveys conducted at that time indicated that there was no contamination that exceeded the NRC release limits, there is no basis to conduct further sampling of this area.

 Request that the safety of workers be considered because 400 counts per minute was found in Hanger No. 91.

This area does not constitute a radiological hazard since the material is below the NRC unrestricted use guideline value of a maximum of 15,000 disintegrations per minute (dpm). The contamination identified at 400 counts per minute (cpm) when corrected is about 1200 dpm, which is well below the 15,000 dpm limit. , he soils should be better evaluated and the monitoring wells should be tested at several depths.

Our review of past NRC inspection reports and the confirmatory surveys conducted by ORAU for the NRC did not indicate any environmental contamination in excess of NRC release limits. Therefore, our selection of sampling locations focused on the areas where the likelihood of finding contamination existed. If our inspection activities find little or no contamination in those areas of highest likelihood of occurrence, then it would not be expected to be found at other locations. If higher sampling would be expanded as appropriate. At the Goodyear facility at Wingfoot Lake, we have not found levels of contamination that would warrant an increase in the scope of our sampling.

Request that Darrel Wiedeman (Region III Health Physics Inspector) go to Akron to interpret the FOIA material sent to Ms. Grimmett.

If you have questions regarding the documents you obtained from the NRC or questions related to our policies or regulations, please provide your questions to us in writing. We will then provide you with a written response as soon as possible.

#### ATTACHMENT 3

#### Response to June 17, 1994 Letter

\* Mr. Snell from the Regional Office had already made a verbal judgement that no more testing was needed.

Mr. Snell candidly discussed the facts involved in determining the extent of future sampling that would be needed and how we could best obtain those samples. When you discussed this issue with Mr. Snell, a decision had not been made as to what additional sampling, if any, would be conducted. Our subsequent decision was to send Mr. Darrel Wiedeman back to the Goodyear facility to obtain additional fish samples and to obtain a water sample from one of the monitoring wells. This was completed on June 22, 1994. Based on uncertainties regarding the results of the fish analysis, we made the additional decision to send another inspector to Wingfoot Lake to collect five lake sediment samples. While there, the inspector also collected two additional residential well water samples at the request of another concerned citizen. This was completed on July 7, 1994.

 Request hard data confirming the residential wells showed background radiation levels.

The attached inspection report provides the results of gross alpha and gross beta radioactivity present in the residential wells sampled. In all cases, the levels were belc: the U.S. EPA's limits (National Interim Primary Drinking Water Regulations) for gross alpha, gross beta, and total uranium in drinking water.

When the NRC requested the Oak Ridge Institute for Science and Education (ORISE) to count the samples, the request was to determine whether the samples exceeded the EPA drinking water criteria. As a result, sample counting times were selected to provide statistically acceptable results to a level of confidence to show whether the sample was above or below the EPA criteria. The levels of radiation were in all likelihood well below the level shown, which is why the "less than" sign (<) proceeds most of the values. It indicates that there is a high level of confidence to as "below the minimally detectable level" when discussing the results of samples. Since we were interested in the level of radiation in the wells versus the EPA drinking water criteria, a rigorous determination of actual background was not necessary.

NRC missed the opportunity to test monitoring wells.

A water sample was collected from one of the monitoring wells on June 22, 1994.

page 1 of 2

The NRC should install additional monitoring wells to sample for radiation.

It has been our mission to conduct environmental sampling in a manner that would indicate the potential for radioactive contamination to exist as a result of NRC licensed activities that had previously occurred at the Goodyear Wingfoot site. Our inspection and sampling results have not provided any evidence of the existence of radioactive contamination at a level that would justify the installation of monitoring wells.

\* NRC report of July 1986 indicated there was contamination at unacceptable levels and that the NRC did not come in to confirm the contamination.

Oak Ridge Associated Universities (ORAU) was under contract to the NRC in 1986 to conduct confirmatory surveys at Goodyear's Wingfoot facility. As a result of conducting those surveys, ORAU identified several areas where the NRC release level was exceeded. As a result of those survey results, Goodyear either decontaminated or removed those areas that were contaminated in excess of the release limits. Followup surveys by ORAU confirmed that efforts to decontaminate the site were effective, and the site had been remediated to the NRC guidelines.

 Migration of contamination from the sewer line could have taken place before decontamination was conducted.

A review of documentation from 1986 indicated that soil samples analyzed by ORAU and survey and sample results provided by Goodyear identified no contamination of the soil surrounding the sewer line. Survey results indicated that contamination was only found within the sewer, which was removed.

# TELEPHONE LOG

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all <del>Iake</del> Date: <u>8</u> Time:	By:
called:	Name: <u>EPA</u> RegionI Title: <u>RP Department</u> Organization: Phone No.:
SUBJECT:	EPA Water Regulation
Discussio	n:
	Asked if wording we had in the letter to citizen
	of well water results was carrect where we gave
	background of GPA drinking water regulations. He
	stated it was correct.

see Attached

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Name Address City, State Zip

SUBJECT: ANALYSIS OF DRINKING WATER FROM RESIDENTIAL WELLS AROUND WINGFOOT LAKE, PORTAGE COUNTY, OHIO

Dear

During the period from April 25 through July 8, 1994, the Nuclear Regulatory Commission (NRC) conducted a special inspection at the Goodyear Wingfoot Lake Advanced Technology Center in Portage County, Ohio. Included in this inspection was the collection of residential drinking water in and around the Goodyear Wingfoot Lake facility. Your residence was selected as a sample location and you voluntarily allowed our inspectors to collect a sample of your drinking water. These samples were analyzed for gross alpha and beta radiation by an NRC contractor, the Oak Ridge Institute for Science and Technology (ORISE) in Oak Ridge, Tennessee. The results were then compared to the U. S. Environmental Protection Agency (EPA) standards for drinking water.

The EPA National Primary Water Regulations were promulgated on December 24, 1975, in accordance with the provisions of the Safe Drinking Water Act (Public Law 93-523). Additional Interim Primary Regulations for radioactivity in drinking water were promulgated on July 9, 1976. These regulations became effective on June 24, 1977, and became the standard by which all <u>public</u> drinking water supplies are evaluated. Although the above referenced drinking water regulations <u>do not</u> apply to private residential water wells, it is our practice to use the EPA criteria to determine the acceptability of the levels of radioactivity in private residential water.

Based on our review of the analysis of the sample of well water taken from your residence, the levels of gross alpha and beta radiation in the sample did not exceed the EPA National Primary Water Regulations.

Thank you for your cooperation in this matter. If you have any question regarding the above, please contact Mr. William Snell at (708) 829-9871.

Sincerely,

George M. McCann, Chief, Fuel Facilities and Decommissioning Section

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