NRC Form 374
(5-84)

U.S. NUCLEAR REGULATORY COMMISSION

MATERIALS LICENSE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 40 and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

COPY

Licensee	
1. Allied Corporation Allied Chemical Company 2. P.O. Box 430 Metropolis, Illinois 62960	3. License number SUB-526, as renewed 4. Expiration date June 1, 1990 5. Docket or Reference No. 40-3392

6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
A. Natural Uranium	A. "Yellowcake", U_3O_8, UO_2, UF_4, UF_6	A. 68 million kg (150 million lb)
B. Cs-137	B. Sealed Sources	B. 300 millicuries

9. Authorized Use: For use in accordance with the statements, representations, and conditions contained in Chapters C-1 through C-7 of the license renewal application dated December 9, 1983, and supplements dated March 7, and August 1, 1984.

10. Authorized Place of Use: The licensee's existing facilities at Metropolis, Illinois.

11. In the conditions section of the license renewal application, the term "are" shall be interpreted as "shall be" in all instances where this term is used to denote services or actions by the licensee.

12. Personnel with appropriate health physics training shall be present at the plant at all times when operations involving source material are being conducted. The licensee shall attain compliance with this condition on or before September 30, 1985.

13. Health physics personnel shall be present whenever entry is made into containment structures, including ventilation baghouses, where the potential exists for exposure to airborne radioactivity concentrations greater than those specified in 10 CFR Part 20, Appendix B, Table 1. The licensee shall attain compliance with this condition on or before September 30, 1985.

14. The licensee shall prepare, on a semi-annual basis, a report summarizing and evaluating all of the radiological measurements made at the facility, including airborne radioactivity, surface contamination, internal and external exposures, effluents, and environmental monitoring. This report shall be provided to the ALARA Committee, the Plant Manager, and other levels of supervision as necessary for appropriate action.

15. Prior to performing work for which a Radiation Work Permit is required, the employee shall be provided with specific instructions regarding the task, the necessary safety precautions, and any safety equipment required. Receipt and understanding of this information shall be documented on the permit and shall include the employee's signature.

16. Notwithstanding the statements made in C-2.7 of the license renewal application, the Health Physicist shall conduct quarterly a formal audit of plant operations which involve source materials in accordance with a preconceived written plan to determine compliance with regulations, license conditions, and licensee procedures. All areas involving source materials shall be audited at least annually. The findings of the audit, including deficiencies and the corrective actions taken, shall be documented in a formal report to the Plant Manager. The licensee shall attain compliance with this condition on or before July 31, 1985.

17. The licensee shall maintain operational survey instruments for personnel contamination surveys at all access points to contamination controlled areas. These instruments shall be of a suitable type and sensitivity to detect the presence of contamination on the skin or clothing in excess of 200 dpm/100 cm^2. If contamination in excess of background levels is detected, decontamination of the employee shall be effected to reduce levels to background. The licensee shall not permit any individual to exit the contamination controlled area with contamination above background levels without the specific approval of the Health Physicist. The licensee shall attain compliance with this condition on or before September 30, 1985.

18. Sealed sources shall be subject to the leak testing and actions specified in the attached Annex A, "License Condition for Leak Testing Sealed Byproduct Material Sources," dated November 1979.

19. Release of equipment or packages from the plant site or to uncontrolled areas onsite shall be in accordance with the attached Annex B, "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 July 1982.

20. Within 6 months of the issuance of this license, the licensee shall prepare and submit to the Uranium Fuel Licensing Branch the following reports. These reports shall contain sufficient detail and analysis to allow an independent review and shall contain licensee commitments for the actions described.

    a. A report detailing operational modifications and actions to be taken to reduce the potential for a massive UF_6 release.

    b. A report detailing measures and actions to mitigate the effects of a UF_6 release. This report shall deal with the potential release of material within the facility and outside of the facility.

21. On a semiannual basis, Allied shall take samples and perform uranium and fluoride analyses of bottom sediment from the liquid effluent drainage ditch from, at a minimum, locations approximately 700 and 1400 feet downstream of Outfall 002.

22. Notwithstanding the four steps for determining compliance with 40 CFR 190 (Section C-4.2, Page C-22), the licensee shall assure compliance with 40 CFR 190 as follows:

a. If the average air concentration of total alpha radioactivity (the sum of natural uranium, radium-226, and thorium-230) measured from samples collected from existing Station No. NR-7 (adjacent to the home of the nearest residence North-Northeast of the plant) exceeds 3.0×10^{-14} µCi/ml over any calendar quarter, the licensee shall, within 30 days, prepare and submit to the Commission a written report which identifies the cause for exceeding the limit and the corrective actions to be taken by the licensee to reduce radioactivity release rates.[1] If the parameters important to a dose assessment change, a report shall be submitted within 30 days which describe the changes in parameters and includes an estimate of the resultant change in dose commitment.[1]

b. In the event that the calculated dose to any member of the public in any consecutive 12-month period is about to exceed the limits specified in 40 CFR 190.10, the licensee shall take immediate steps to reduce emissions so as to comply with 40 CFR 190.10. As provided in 40 CFR 190.11, the licensee may petition the Nuclear Regulatory Commission for a variance from the requirements of 40 CFR 190.10.[1] If a petition for a variance is anticipated, the licensee shall submit the request at least 90 days prior to exceeding the limits specified in 40 CFR 190.10.

c. The licensee shall continue the existing environmental air monitoring program (committed to in Section C-4.2, first paragraph, pages C-21 and C-22, including commitment to monitor fluoride). Continuous air sampling shall be conducted at all the stations and the air samples shall be composited at each station and analyzed at least monthly for uranium and at least quarterly for radium-226 and thorium-230. All radiological analyses specified above shall be performed with an analytical sensitivity of at least 10^{-16} µCi/ml.

d. Samples taken at Station No. NR-7 shall be composited at least quarterly and analyzed for uranium solubility. The solubility analysis shall follow the methodology and procedures established by Battelle Pacific Northwest Laboratories (BNWL)[2,3] or an equivalent method acceptable to NRC. If a laboratory other than BNWL is used for the analysis, the licensee shall provide NRC with a split sample so that the NRC can perform a verification analysis.

e. The licensee shall determine the particle size distribution of radioactivity in air at Station No. NR-7 using a multiple stage cascade impactor capable of fractionating particles in the respirable and non-respirable size ranges. The impactor

---

[1]The report or petition should be submitted to the Director, Office of Nuclear Material Safety and Safeguards, with a copy to the Director of the Regional Office of Inspection and Enforcement.

[2]Solubility Classification of Airborne Products from Uranium Ores and Tailings Piles - D. R. Kalkwarf, BNWL, November 1978, USDOE Contract No. EY-76-C-04-1830.

[3]Second Quarterly Report on Solubility Classification of Airborne Products from LWR-Fuel Plants - D. R. Kalkwarf, BNWL, October 15, 1979.

shall be operated continuously except for those periods required for disassembly for particle size distribution analysis. The particle size distribution analysis shall be performed at least once per month as a minimum and more often if necessary to assure effective particle retention and fractionation.

f. The actual particle size distribution, material solubilities, and air concentrations, determined as required in Condition 22 c, d, and e above, shall be used to calculate the dose to the public for purposes of Condition 22 b.

23. Allied shall investigate why the uranium content of recent (1979-1982) soil and vegetation samples from both onsite and offsite locations is significantly higher than the content determined during the 1968-1973 period. The findings of this investigation, including a proposal of what (if any) action by Allied is necessary to stop this increasing trend, shall be reported to the NRC's Uranium Fuel Licensing Branch within 1 year of the date of this license.

24. Notwithstanding the statements made in Section C-6 of the license renewal application and the referenced general decommissioning plan dated August 14, 1978, no licensed material shall be buried onsite without specific approval by the Commission.

25. The licensee shall be exempted from the requirements of 10 CFR 20.203(e)(1) and 20. 203(f)(1) as provided in Section C-1.8 of the license renewal application.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Date: MAY 28 1985

By: Original Signed By:
W. T. Crow

Division of Fuel Cycle and
Material Safety, NMSS
Washington, D.C. 20555

COPY

VETC 5/28/85
5/23/85
VLT 5/23/85
SDW 5/23/85

Annex A

LICENSE CONDITION FOR

LEAK TESTING SEALED BYPRODUCT MATERIAL SOURCES

November 1979

A. Each source shall be tested for leakage at intervals not to exceed six (6) months. In the absence of a certificate from a transferor indicating that a test has been made within six (6) months prior to the transfer, the sealed source shall not be put into use until tested.

B. The test shall be capable of detecting the presence of 0.005 microcurie of contamination on the test sample. The test sample shall be taken from the source or from appropriate accessible surfaces of the device in which the sealed source is permanently or semipermanently mounted or stored. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.

C. If the test reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired by a person appropriately licensed to make such repairs or to be disposed of in accordance with the Commission regulations. Within five (5) days after determining that any source has leaked, the licensee shall file a report with the Director, Division of Fuel Cycle and Material Safety, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, describing the source, the test results, the extent of contamination, the apparent or suspected cause of source failure, and the corrective action taken. A copy of the report shall be sent to the Director of the nearest NRC Inspection and Enforcement Office listed in Appendix D of Title 10, Code of Federal Regulations, Part 20.

D. The periodic leak test required by this condition does not apply to sealed sources that are stored and not being used. The sources excepted from this test shall be tested for leakage prior to any use or transfer to another person unless they have been leak tested within six (6) months prior to the date of use or transfer.

ANNEX B

GUIDELINES FOR DECONTAMINATION OF FACILITIES AND EQUIPMENT PRIOR TO RELEASE FOR UNRESTRICTED USE OR TERMINATION OF LICENSES FOR BYPRODUCT, SOURCE, OR SPECIAL NUCLEAR MATERIAL

U. S. Nuclear Regulatory Commission
Division of Fuel Cycle and Material Safety
Washington, D.C. 20555

July 1982

The instructions in this guide, in conjunction with Table 1, specify the radionuclides and radiation exposure rate limits which should be used in decontamination and survey of surfaces or premises and equipment prior to abandonment or release for unrestricted use. The limits in Table 1 do not apply to premises, equipment, or scrap containing induced radioactivity for which the radiological considerations pertinent to their use may be different. The release of such facilities or items from regulatory control is considered on a case-by-case basis.

1. The licensee shall make a reasonable effort to eliminate residual contamination.

2. Radioactivity on equipment or surfaces shall not be covered by paint, plating, or other covering material unless contamination levels, as determined by a survey and documented, are below the limits specified in Table 1 prior to the application of the covering. A reasonable effort must be made to minimize the contamination prior to use of any covering.

3. The radioactivity on the interior surfaces of pipes, drain lines, or ductwork shall be determined by making measurements at all traps, and other appropriate access points, provided that contamination at these locations is likely to be representative of contamination on the interior of the pipes, drain lines, or ductwork. Surfaces of premises, equipment, or scrap which are likely to be contaminated but are of such size, construction, or location as to make the surface inaccessible for purposes of measurement shall be presumed to be contaminated in excess of the limits.

4. Upon request, the Commission may authorize a licensee to relinquish possession or control of premises, equipment, or scrap having surfaces contaminated with materials in excess of the limits specified. This may include, but would not be limited to, special circumstances such as razing of buildings, transfer of premises to another organization continuing work with radioactive materials, or conversion of facilities to a long-term storage or standby status. Such requests must:

   a. Provide detailed, specific information describing the premises, equipment or scrap, radioactive contaminants, and the nature, extent, and degree of residual surface contamination.

   b. Provide a detailed health and safety analysis which reflects that the residual amounts of materials on surface areas, together with other considerations such as prospective use of the premises, equipment or scrap, are unlikely to result in an unreasonable risk to the health and safety of the public.

5. Prior to release of premises for unrestricted use, the licensee shall make a comprehensive radiation survey which establishes that contamination is within the limits specified in Table 1. A copy of the survey report shall be filed with the Division of Fuel Cycle and Material Safety, USNRC, Washington, D.C. 20555, and also the Administrator of the NRC Regional Office having jurisdiction. The report should be filed at least 30 days prior to the planned date of abandonment. The survey report shall:

   a. Identify the premises.

   b. Show that reasonable effort has been made to eliminate residual contamination.

   c. Describe the scope of the survey and general procedures followed.

   d. State the findings of the survey in units specified in the instruction.

   Following review of the report, the NRC will consider visiting the facilities to confirm the survey.

TABLE 1

ACCEPTABLE SURFACE CONTAMINATION LEVELS

NUCLIDES[a]	AVERAGE[b c f]	MAXIMUM[b d f]	REMOVABLE[b e f]
-nat, U-235, U-238, and ssociated decay products	5,000 dpm α/100 cm^2	15,000 dpm α/100 cm^2	1,000 dpm α/100 cm^2
ransuranics, Ra-226, Ra-228, h-230, Th-228, Pa-231, c-227, I-125, I-129	100 dpm/100 cm^2	300 dpm/100 cm^2	20 dpm/100 cm^2
h-nat, Th-232, Sr-90, a-223, Ra-224, U-232, I-126, -131, I-133	1000 dpm/100 cm^2	3000 dpm/100 cm^2	200 dpm/100 cm^2
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above.	5000 dpm $\beta\gamma$/100 cm^2	15,000 dpm $\beta\gamma$/100 cm^2	1000 dpm $\beta\gamma$/100 cm^2

[a] Where surface contamination by both alpha- and beta-gamma-emitting nuclides exists, the limits established for alpha- and beta-gamma-emitting nuclides should apply independently.

[b] As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

[c] Measurements of average contaminant should not be averaged over more than 1 square meter. For objects of less surface area, the average should be derived for each such object.

[d] The maximum contamination level applies to an area of not more than 100 cm^2.

[e] The amount of removable radioactive material per 100 cm^2 of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.

[f] The average and maximum radiation levels associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/hr at 1 cm and 1.0 mrad/hr at 1 cm, respectively, measured through not more than 7 milligrams per square centimeter of total absorber.