

PROCEDURE: KM-BC-20-2
REVISION: 5
DATE: January 22, 1988

SEQUOYAH FUELS CORPORATION
CIMARRON FACILITY
HEALTH PHYSICS

SUBJECT: ENVIRONMENTAL MONITORING PROCEDURE

PREPARED BY: [Signature] DATE 1-18-88
Health Physics Specialist

REVIEWED BY: [Signature] DATE 1-22-88
Health Physics Supervisor

REVIEWED BY: [Signature] DATE 1-24-88
Standby Operations Manager

REVIEWED BY: [Signature] DATE 1-24-88
Director, Health Licensing and
Regulation

✓ REVIEWED BY: [Signature] DATE 1-24-88
Corporate Health Physicist

APPROVED BY: [Signature] DATE 1-24-88
Director, Contract Management and
Cimarron Operations

PROCEDURE

DATE

1-22-88

NO.

EM-MC-20-2, Rev

SUBJECT

ENVIRONMENTAL MONITORING
PROCEDURESEQUOYAN FUELS CORPORATION
RADIATION HEALTH AND SAFETY
CIMARRON FACILITY

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PURPOSE: Establish practice for monitoring Cimarron Facility effluents and their effect on the environment.

RESPONSIBILITY:**ACTION:**Facility Manager and/or
His Designated Alternate(s)

1. Approve environmental monitoring practices.
2. Administratively responsible for obtaining permission to collect off-site samples.

Decon Supervision

1. Inform Health Physics of releases of radioactive material or chemicals which may affect the environment.

Maintenance and Utility
Supervision

1. Provide maintenance as requested by Health Physics Supervision.

Health Physics
Supervision

1. Provide Health Physics personnel to collect environmental samples.
2. Determine environmental sampling locations.
3. Report significant sample results to management.

Health Physics Technicians

1. Collect effluent and environmental samples.
2. Prepare water, soil and vegetation samples for shipment to Kerr-McGee Technical Center for analysis.
3. Prepare air samples for alpha counting and for shipment to Oklahoma State Health Department.

SAMPLING TECHNIQUESA. Effluents will be sampled regularly to determine radioactivity content

1. While stacks are in use, gaseous effluents will be sampled continuously. The samples will be collected and analyzed for radioactive material at least once each week.

2. Liquid effluents include domestic wastes and process wastes.

Domestic waste from laundry and restrooms is released to the sanitary lagoon.

Process waste will be monitored to determine whether it will be pumped to sanitary lagoon if < 0.1 MPC for the plutonium plant (MPC = 4.0×10^{-6} μ ci/ml) and 1.0 MPC for the uranium plant (MPC = 3.0×10^{-5} μ ci/ml).

B. Air, water, soil and vegetation samples will be collected to determine radioactive material and chemical content

1. Off-site air samples will be collected by high volume samplers at three locations. Samples will be collected on 8 x 10 inch filter paper over four-hour intervals each day and the filter paper will be changed each week when weather conditions permit (sampling will be cycled through twenty-eight hours each week). The sample filters will be divided for counting by the Oklahoma State Department of Health and Sequoyah Fuels Health Physics personnel. Samples will be counted for gross alpha, but uranium and plutonium analyses may be performed on samples significantly above background.

2. Samples will be collected weekly from the sanitary lagoon and analyzed for gross alpha activity. Annual samples will be collected from the Cimarron River, upstream and downstream, six ponds, one stream, three water wells, and fourteen monitor wells and analyzed for uranium, plutonium, nitrate, fluoride, gross alpha and gross beta activity, and other radionuclides as needed.

3. Soil samples (composite of 10 surface plugs 3" diameter and 2" deep, then composite of 10 subsurface plugs 3" diameter and 10" deep) will be collected annually at 18 locations and analyzed for uranium, plutonium and fluoride.
4. Vegetation samples (500 grams) will be collected annually from 10 locations near the Cimarron Facility and analyzed for uranium, plutonium and fluoride.
5. Special samples will be collected if positive results are obtained from routine samples or to define the extent of a release.

C. Gamma radiation will be monitored with TLD packets.

1. TLD packets will be located on boundary fences in six locations. The TLD's will be changed and processed quarterly.

SAMPLING LOCATIONS

A. Sampling locations are shown on attached diagrams.

1. Air samples will be collected one-half mile north, east and south of the Facility.
2. Water samples will be collected from: the sanitary lagoon, the Cimarron River near Highway 74 bridge and three-fourth mile down-stream; pond west of the Cimarron Facility entrance; water supply ponds, slough located northwest of the cold incinerator; stream north of covered waste pond 2; well in pasture northeast of the Plutonium Plant; monitor wells surrounding the uranium waste ponds (now covered over), if there is any water present; monitor wells around old burial ground; well located at Highway 33/74 intersection; and abandoned well in old corral northwest of old burial ground.
3. Soil samples will be collected north of the Uranium Plant boundary fence; south of the Uranium Plant boundary fence; north of Plutonium Plant boundary fence; one-half mile north, east, south and west of the Cimarron Facility; one mile north, east, south and west of the Cimarron Facility, two miles northeast, northwest, southeast and southwest of the Cimarron Facility; three, five and ten miles north of the Cimarron Facility.

4. Vegetation samples will be collected north of the Uranium Plant boundary fence; south of the Uranium Plant boundary fence; north of the Plutonium Plant boundary fence; one-half mile east, west, north and south of the Cimarron Facility; on the two covered Uranium waste ponds; and on the old burial pit.
5. Gaseous samples will be collected from exhaust stacks which are in use.

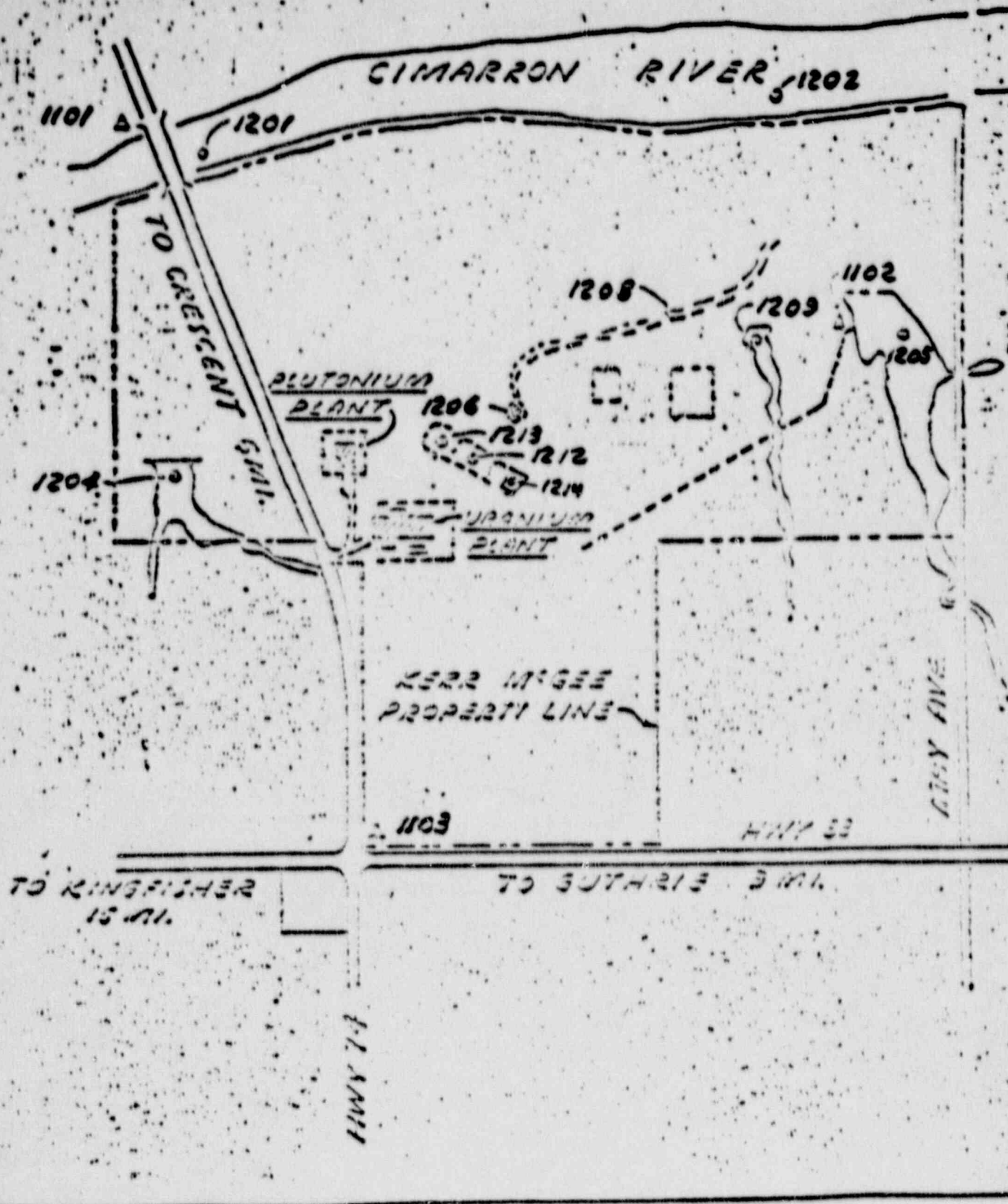
CIMARRON FACILITY ENVIRONMENTAL SAMPLING SCHEDULE

<u>Sample No.</u>	<u>Sample Location</u>	<u>Sample Frequency</u>	<u>Sample Analysis</u>
<u>AIR</u>		Weekly	Gross 1
1101	North - 1/4 mi.		
1102	East - 1/4 mi.		
1103	South - 1/4 mi.		
<u>SURFACE WATER</u>		Annually	U, Pu, P, NO ₃ , Gross 1 Gross 3
1201	Cimarron River - Upstream		
1202	Cimarron River - Downstream		
1204	Pond - West of Plant		
1205	K-M Lake - East		
1206	Slough - SW of Incinerator		
1208	Stream North of Uranium Pond #1		
1209	K-M Lake - West		
1212	Sanitary Lagoon - East		
1213	Sanitary Lagoon - West		
1214	Sanitary Lagoon*		
<u>WELL WATER</u>		Annually	U, Pu, P, NO ₃ , Gross 1 Gross 3
1301	Well - North of Plant		
1307	Well - Jct. Hwy. 13,74		
1302	Monitor Well - SW of Uranium Pond #1		
1304	Monitor Well - NW of Uranium Pond #1		
1305	Monitor Well - NW of Uranium Pond #1		
1306	Monitor Well - SE of Uranium Pond #1		
1308	Monitor Well - NE of Uranium Pond #1		
1309	Monitor Well - SW of Uranium Pond #2		
1310	Monitor Well - S of Uranium Pond #2		
1311	Monitor Well - S of Land Fill		
1312	Monitor Well - W of Land Fill		
1313	Monitor Well - N of Land Fill		
1314	Monitor Well - S of Burial Pit		
1315	Monitor Well - N of Burial Pit		
1316	Monitor Well - NW of Burial Pit		
1317	Monitor Well - N of Burial Pit next to wheat field		
1318	Leo's Cortal (abandoned water well)		

* Weekly radioactivity samples, in addition to annual samples.

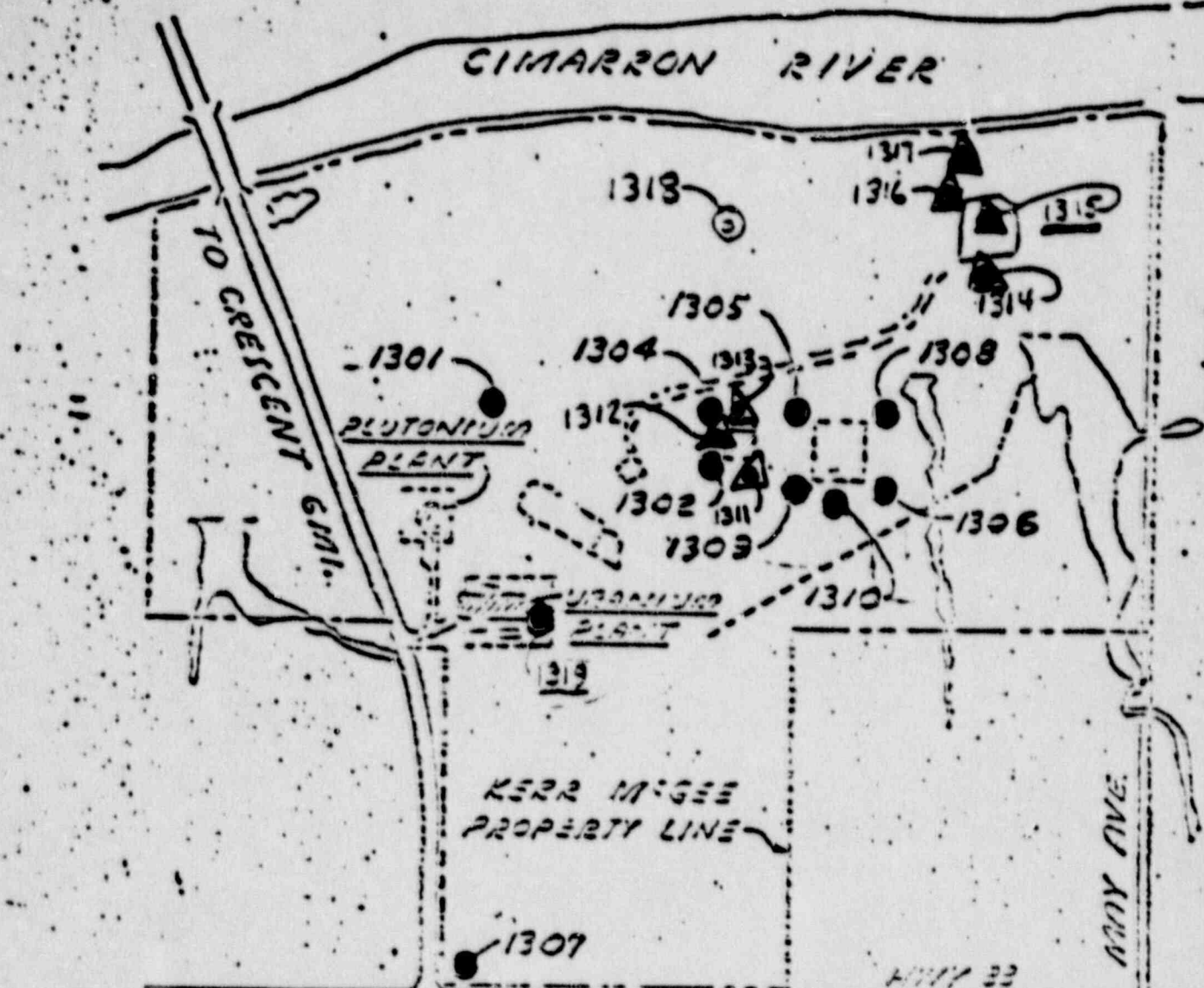
<u>Sample No.</u>	<u>Sample Location</u>	<u>Sample Frequency</u>	<u>Sample Analysis</u>
	<u>SOIL</u>	Annually	U, Pu, F
1401	North - $\frac{1}{4}$ mi.		
1402	North U Fence Line		
1403	South U Fence Line		
1404	South - $\frac{1}{4}$ mi.		
1405	East - $\frac{1}{4}$ mi.		
1406	West - $\frac{1}{4}$ mi.		
1407	North - 1 mi.		
1408	South - 1 mi.		
1409	East - 1 mi.		
1410	West - 1 mi.		
1411	NE - 2 mi.		
1412	NW - 2 mi.		
1413	SW - 2 mi.		
1414	SE - 2 mi.		
1415	North - 3 mi.		
1416	North - 5 mi.		
1417	North - 10 mi.		
1418	North Pu Fence Line		
	<u>VEGETATION</u>	Annually	U, Pu, F
1501	North - $\frac{1}{4}$ mi.		
1502	North J Fence Line		
1503	South J Fence Line		
1504	South - $\frac{1}{4}$ mi.		
1505	East - $\frac{1}{4}$ mi.		
1506	West - $\frac{1}{4}$ mi.		
1508	Covered Pond #1		
1509	Covered Pond #2		
1510	Old Burial Pit		
1511	North Pu Fence Line		

* Weekly radioactivity samples, in addition to annual samples.



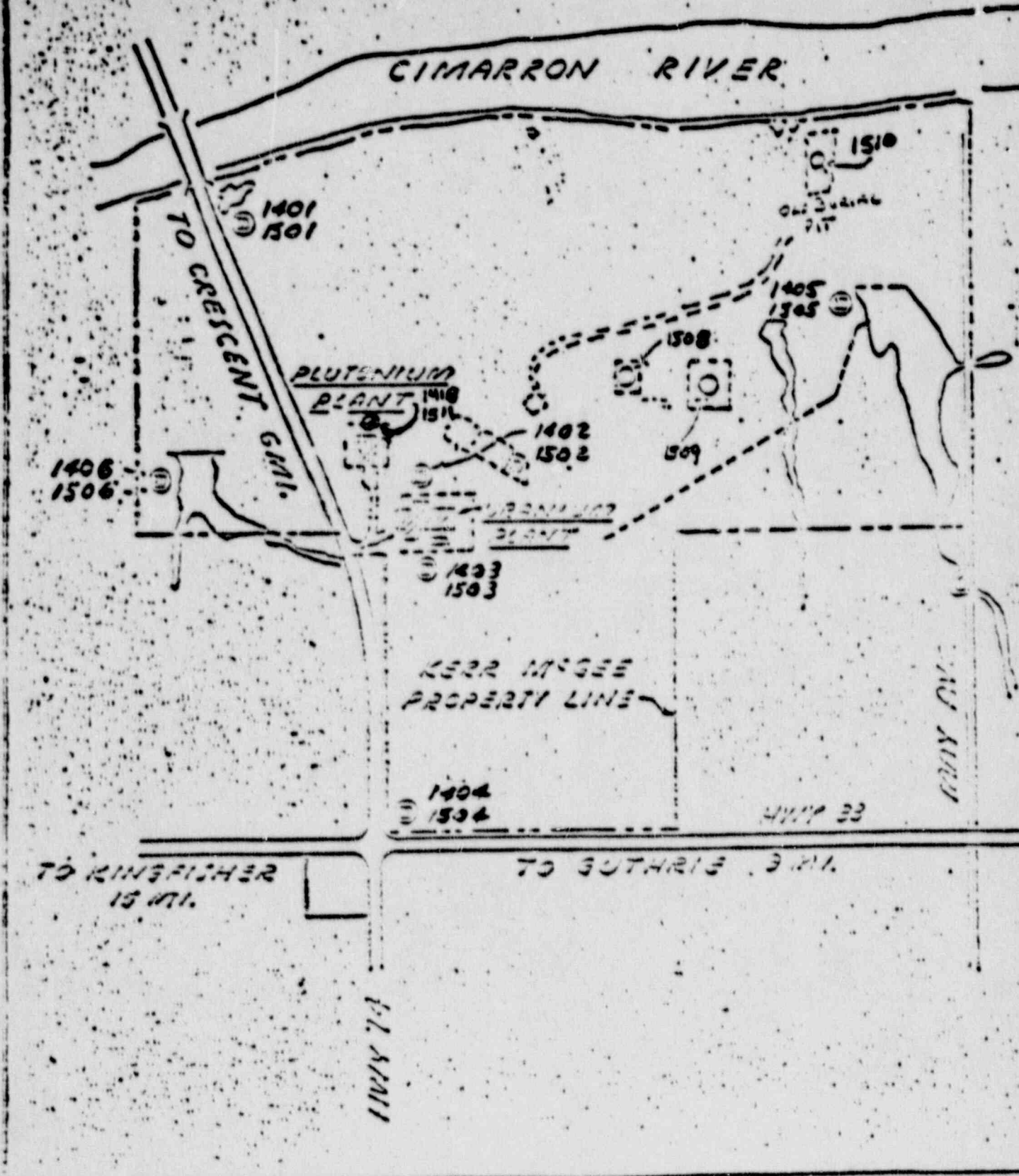
KERR-MCGEE NUCLEAR CORPORATION
RESEARCH FACILITY

Air and Surface Water Sampling Points
 Air (1100 Series) - Δ
 Surface Water (1200 Series) - ○



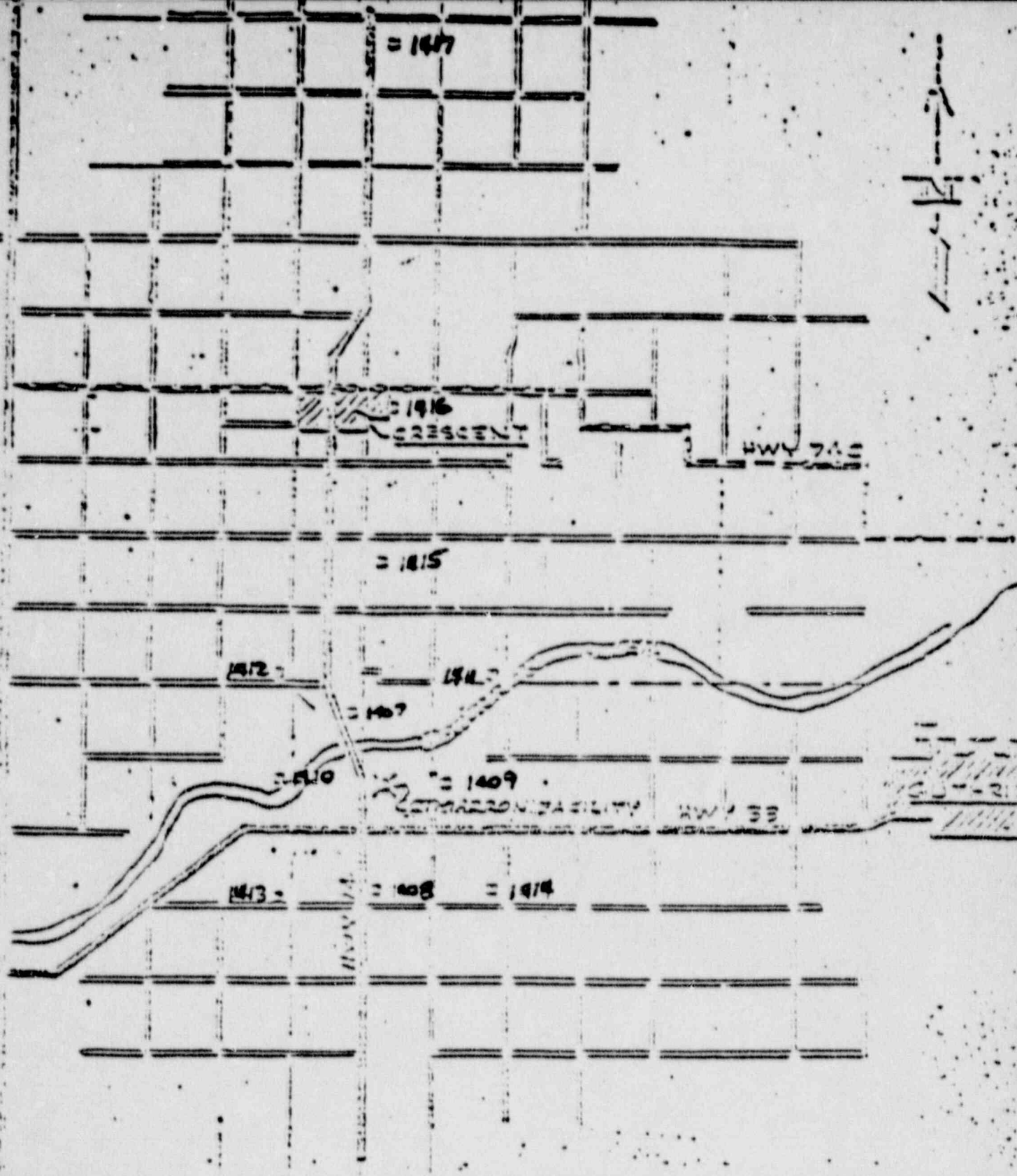
- ▲ - EPA Completed
- - PARAMETERS UNKNOWN

U.S. ENVIRONMENTAL PROTECTION AGENCY
 AIR QUALITY CRITERIA MONITORING SYSTEM
 WASTE WATER SAMPLING POINTS
 WASTE 1011 (1000 SERIES) ●



KERR MCGEE MINING CORPORATION
 PROPERTY LINE

Soil and Vegetation Sampling Points
 Soil (1400 Series) - ●
 Vegetation (1500 Series) - ○



INTERNATIONAL NUCLEAR CORPORATION

GENERAL FACILITY

Soil Sampling Points (Cont'd)