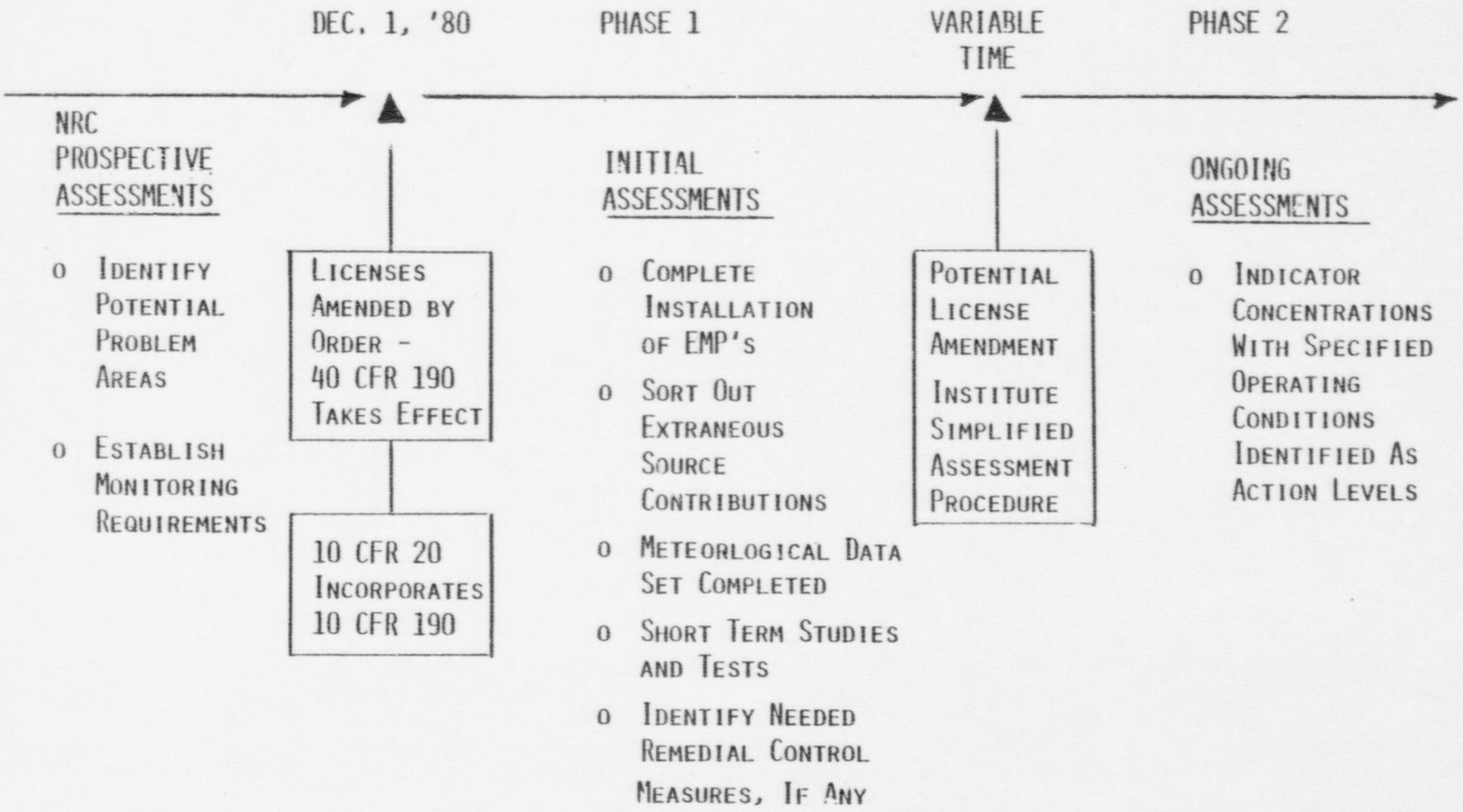
DECEMBER 1, 1980

- 40 CFR 190 TAKES EFFECT
- ORDERS ISSUED TO ALL NRC LICENSEES
- NRC ISSUES REPORT
  - Prospective Assessment of Each Facility
- PREVIOUS COMMITMENTS CONTINUE
  - Interim Performance Objectives
  - Environmental Monitoring Programs
- REVISE 10 CFR 20 TO INCORPORATE 40 CFR 190

PHASED IMPLEMENTATION



ORDERS AMENDING LICENSES

- ENVIRONMENTAL MONITORING PROGRAM
  - Establish Program - Where No Approved Program Exists
  - Modify Existing Programs - Minor Changes In Few Cases
  - Specify Schedule For Installation - where not now installed
  - Invoke Quality Assurance Requirements - R.G. 4.15

- PERIODIC DOSE ASSESSMENTS
  - Commit Operator To Periodic Assessment Procedure
  - Reporting

- SPECIAL INFORMATION NEEDS
  - Short Term Studies
  - Meterology - Full Year's Data Where Not Currently Available
  - Identify And Characterize All Significant Nearby Extraneous Sources

- SUPPLEMENT EXISTING DUST CONTROL REQUIREMENTS
  - Written Operating Procedures
  - Weekly Inspections

NUCLEAR REGULATORY COMMISSION REPORT

- PROSPECTIVE ASSESSMENT EACH MILL
- SUPPORTING BASIS FOR ORDERS
- CONCLUSIONS
  - Existing Requirements for Emission Control Should Assure 40 CFR 190 Is Met At Each Facility
  - No Specific Additional Control Measures Appear Required
  - Additional Information Needed at Some Mills to Make Firm Conclusion
    - Current Data Anomalous or Incomplete
    - Screen Out Extraneous Sources
    - Uncertainty About Effectiveness of Controls

40 CFR 190
COVERAGE

- 25 MILLIREMS TO WHOLE BODY AND ANY OTHER ORGANS
  - Reasonable Assurance
- INCLUDES -
  - Routine Releases From Normal Operations
  - Annual Average
  - Cumulative Mill Sources
- EXCLUDES -
  - Radon and Daughters
  - Natural Background Radiation
  - Mining Operations and Associated Activities
  - Transportation
  - Decommissioning and Decontamination
  - Releases Prior To Dec. 1, 1980 and Associated Ground Contamination

CONTROL OF SOURCES

- INTERIM TAILINGS PERFORMANCE OBJECTIVES
  - Control Blowing of Tailings
  - ALARA - 10 CFR 20
  - NEPA - 10 CFR 51

- OCT. 3 - FINAL MILL REGULATIONS
  - Control Dusting from Tailings and Diffuse Sources
  - Flexibility in Methods
  - Written Operating Procedures
  - Weekly Inspections

- EMISSION CONTROL PRIMARY REQUIREMENT
  - Institutional Control Secondary
  - Strict Control Of Dusting Necessary, As GEIS Illustrates

COMPLIANCE ASSESSMENTS

- PHASED IMPLEMENTATION

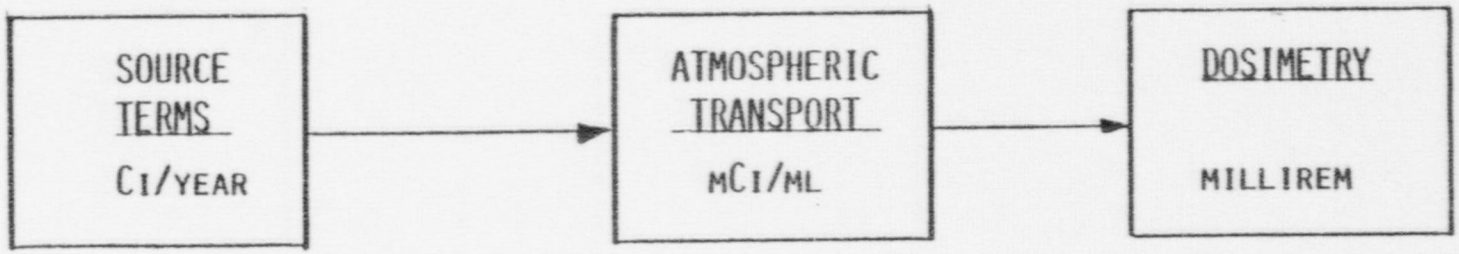
- OBJECTIVES
  - Establish Simple And Standardized Assessment Procedures And Reporting Requirements
  - Assure Consistency
    - BETWEEN MILLS
    - OVER TIME
  - Eliminate Uncertainty
    - PUBLIC
    - MILL OPERATORS
    - REGULATORY AGENCIES
    - OTHER INTERESTED AGENCIES (E.G., EPA, STATE HEALTH SERVICE)
  - Facilitate Prompt Identification Of Problems Where They Exist
  - Minimize Costs And Staff Time For Compliance Assessments

40 CFR 190
COMPLIANCE DETERMINATION

- BASED PRIMARILY ON ACTUAL MONITORING DATA
  - EMPHASIS ON AIR SAMPLING AT NEAREST RESIDENCE

- PREDICTIVE RAD ASSESSMENT MODELS WILL NOT BE BASIS
  - UNCERTAINTY IN SOURCE TERM AND ATMOSPHERIC TRANSPORT MODELS
  - NECESSARY AND VALUABLE TOOLS IN LICENSING OF PROSPECTIVE OPERATIONS
    - IDENTIFY NEEDED CONTROL MEASURES OR POTENTIAL PROBLEM AREAS
    - GUIDE DEVELOPMENT OF ENVIRONMENTAL MONITORING REQUIREMENTS
  - CODES MAY AID IN ACTUAL MONITORING DATA INTERPRETATION

MILDOS


SOURCE TERMS
Ci/YEAR
ATMOSPHERIC TRANSPORT
mCi/ML
DOSIMETRY
MILLIREM

COMPLIANCE DETERMINATION PROCEDURE

- ESTABLISH ENVIRONMENTAL MONITORING PROGRAM

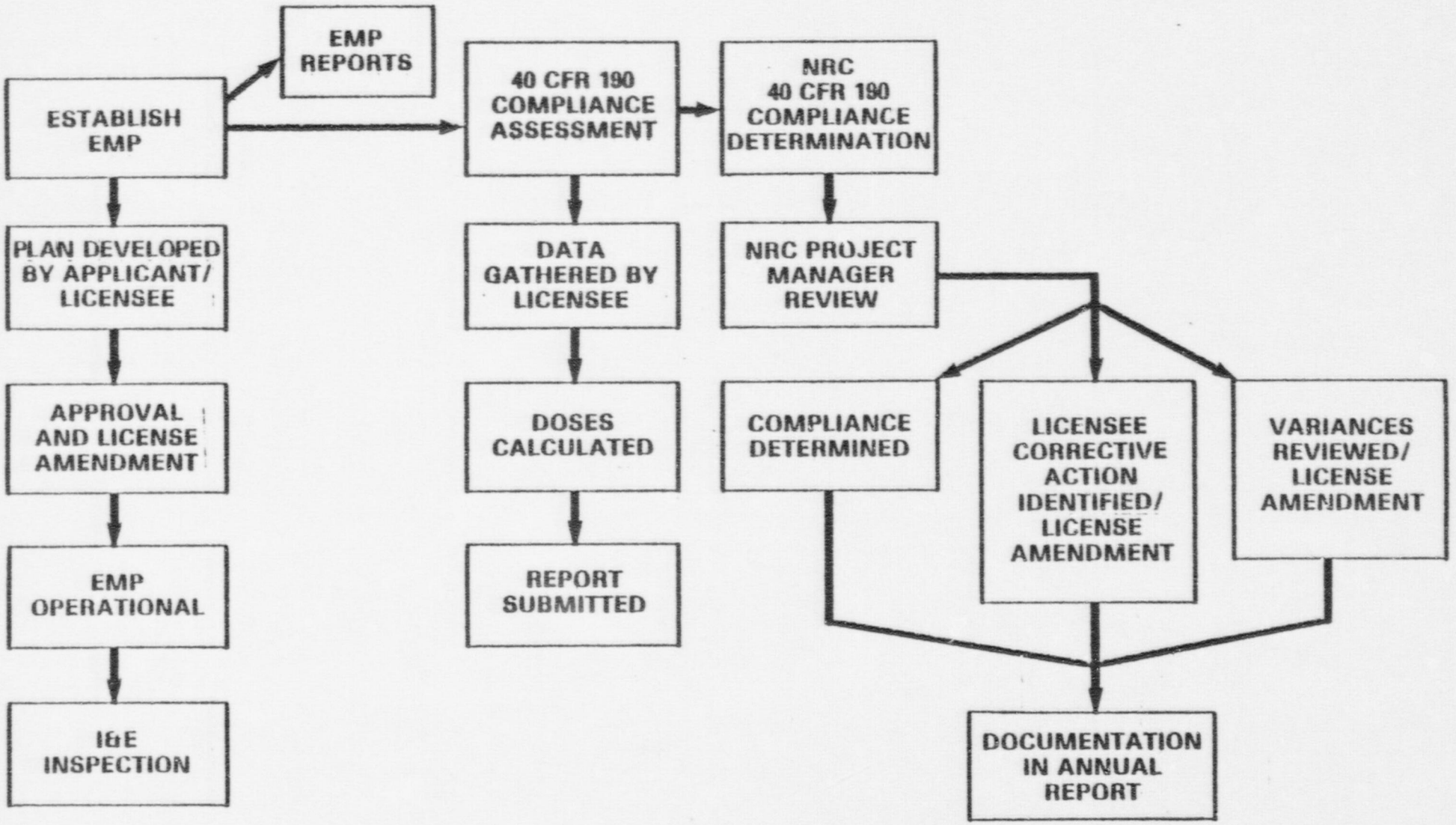
- COLLECT DATA
  - COMPUTE DOSES AT NEAREST RESIDENCE
  - SUBTRACT DOSE CONTRIBUTION FROM EXTRANEOUS SOURCES AND BACKGROUND

- COMPARE DOSE WITH STANDARD - DETERMINE COMPLIANCE
  - IDENTIFY ADDITIONAL CONTROLS, IF ANY NEEDED
  - IDENTIFY FURTHER MONITORING, IF APPROPRIATE

- REPORT TO NRC

FIGURE 1

40 CFR 190
COMPLIANCE DETERMINATION PROCEDURE
(BASED ON ACTUAL ENVIRONMENTAL MONITORING DATA)



ONGOING COMPLIANCE DETERMINATION - PHASE 2

- SIMPLE, STANDARDIZED PROCEDURE

- POINT OF RECEPTOR CONCENTRATION OR DOSE ACTION LEVELS ESTABLISHED
  - BASED ON PHASE 1 MONITORING AND ANALYSIS
  - MAY BE HIGHER THAN 25 MILLIREM
  - COMBINED WITH PRESCRIBED CONTROL MEASURES
  - NO SIGNIFICANT CHANGES IN LOCAL LAND USE OR NEARBY ACTIVITIES

- SIMPLIFIED PROGRAM IMPLEMENTED THROUGH LICENSE AMENDMENTS

MONITORING AND ASSESSMENTS - PHASE 1

- COMPLETE INSTALLATION OF EMP'S
  - FINE TUNING
  - QUALITY ASSURANCE - R.G. 4.15

- SORT OUT EXTRANEOUS SOURCE CONTRIBUTION
  - IDENTIFY MINING AREAS, ORE STORAGE PADS, TRANSPORTATION ROUTES, ETC.

- ESTABLISH SUPPLEMENTAL AIR PARTICULATE SAMPLING STATION
  - SHORT TERM SAMPLING
  - LIMITED ANALYSIS
  - CORRELATION OF METEROLOGICAL DATA

- RE-EVALUATION OF DOSE ESTIMATES - ESTABLISH SIMPLIFIED CONCENTRATION OR DOSE ACTION LEVELS

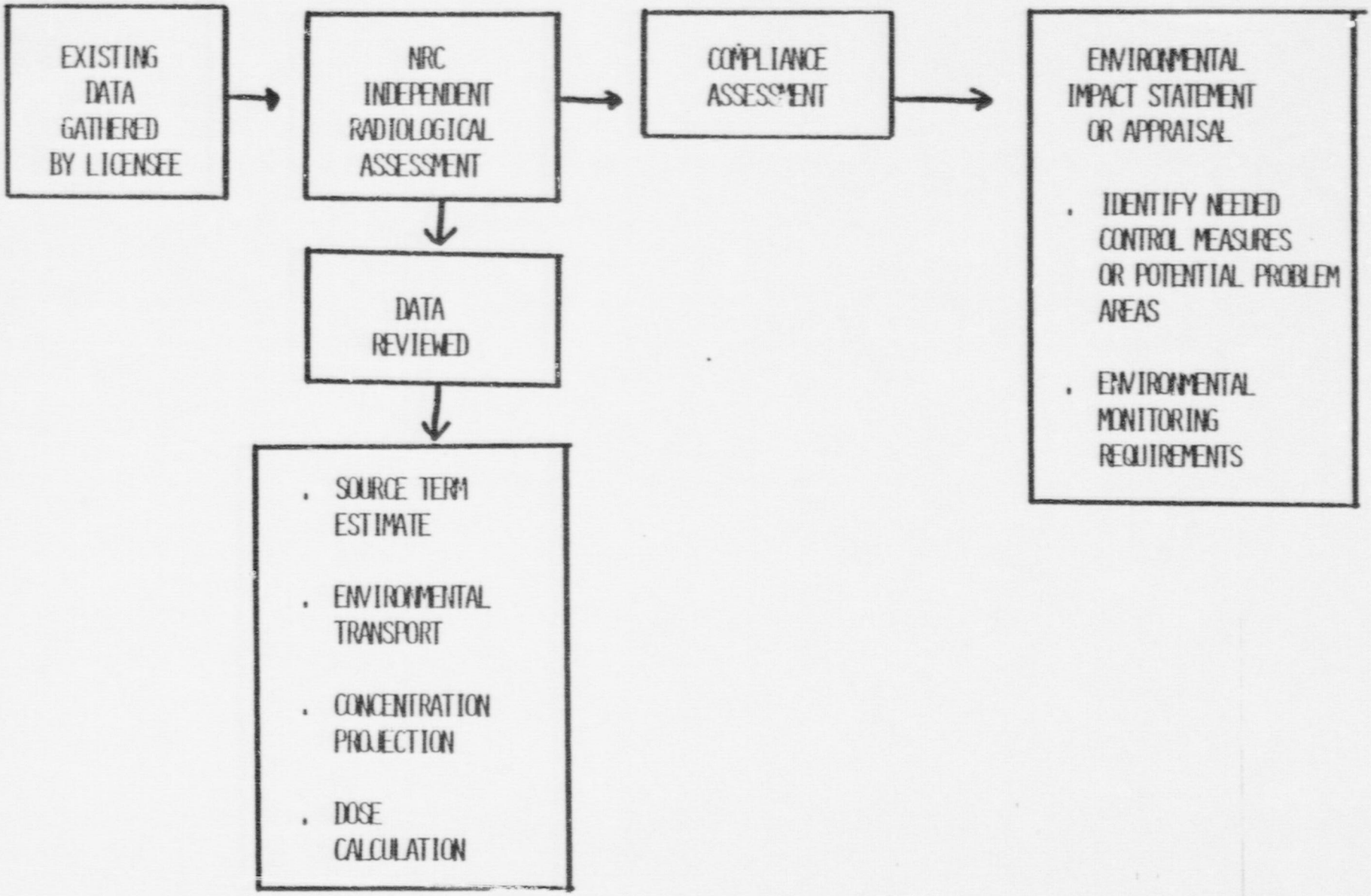
REPORTING REQUIREMENTS

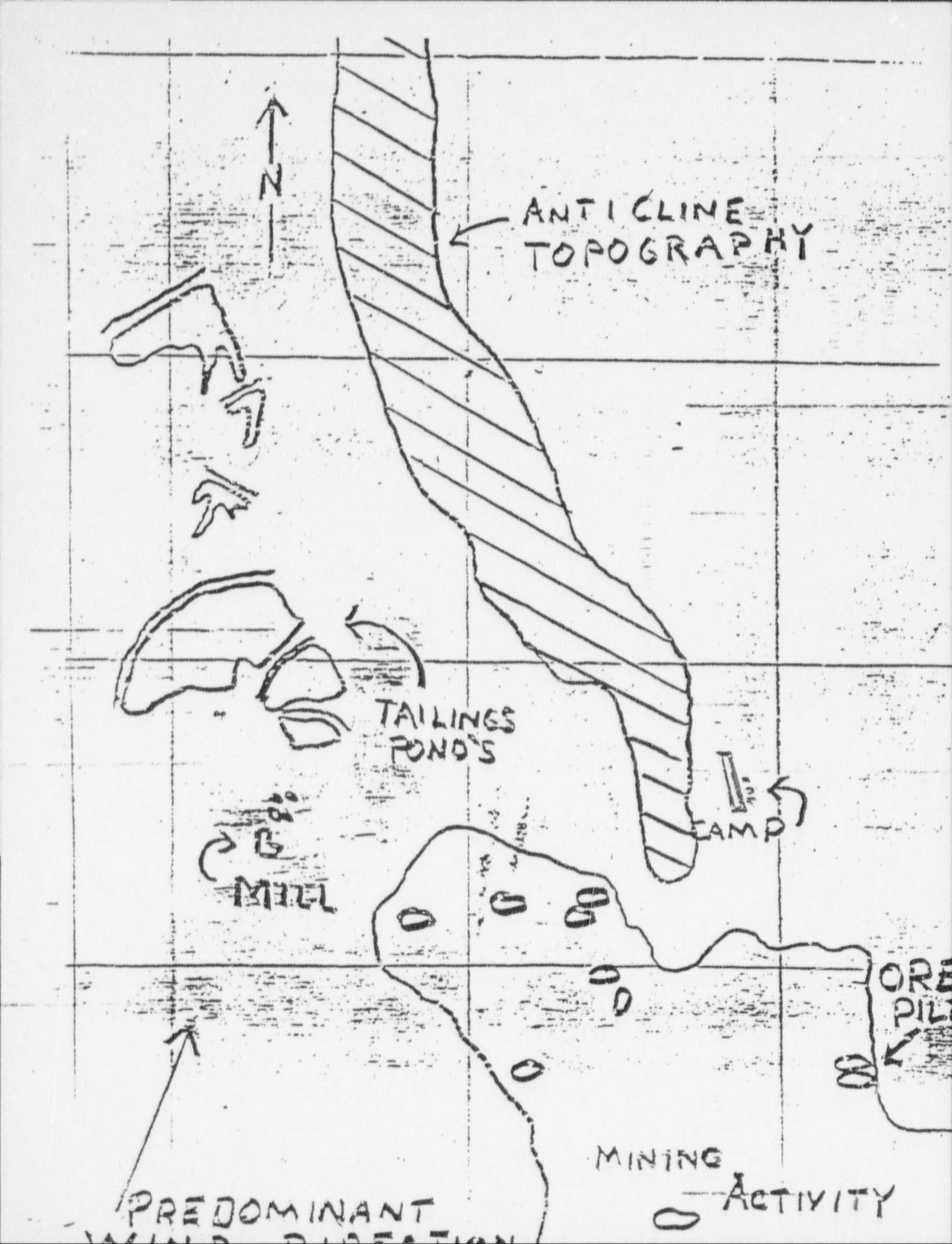
	PHASE 1	PHASE 2
ROUTINE REPORTING	QUARTERLY (60 DAYS AFTER QUARTER END)	SEMI ANNUALLY (60 DAYS AFTER 1 JULY AND 1 JAN) 10 CFR 40.65
o IN REG GUIDE 4.14 FORMAT		
o MEETING WMUR COMPLIANCE DETERMINATION PROCEDURE		
NON-COMPLIANCE REPORTING	NONE	30 DAYS AFTER DETERMINATION
o PURSUANT TO 10 CFR 20		

REGULATORY GUIDANCE

- ENVIRONMENTAL MONITORING PROGRAM - R.G. 4.14
- QUALITY ASSURANCE - R.G. 4.15
- DOSE CALCULATIONS - R.G. 802-4
- MILDOS CODE USER'S MANUAL

FIGURE 2
NRC 40 CFR 190 ASSESSMENT OF PROSPECTIVE
MILLING OPERATIONS (BASED ON PREDICTIVE MODELING)




N
ANTICLINE
TOPOGRAPHY
TAILINGS
POND'S
CAMP
MILL
ORE
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MINING
ACTIVITY
PREDOMINANT

MILDOS COMPUTER CODE GENERATED 50-YEAR DOSE COMMITMENTS (in mrem) FROM TYPICAL MILL

	WHOLE BODY	BONE	LUNG
Direct Exposure Pathway			
o Inhalation	0.178	5.21	7.78
o External Gamma	0.005	0.005	0.005
Ingestion Exposure Pathway			
o Vegetable Intake (1)	0.713	8.60	0.713
o Meat Intake (2)	1.40	17.50	1.40
TOTAL	2.30	31.3	9.90

(1) Vegetables are assumed to be grown in local gardens and the nearest resident is assumed to consume only such vegetables.

(2) Meat ingestion was assumed to be from locally grazed livestock.

ACTUAL ENVIRONMENTAL MONITORING
PROGRAM DATA FOR A TYPICAL MILL

LOCATION	ANNUAL AVERAGE CONCENTRATION pCi/m^3		50-YEAR DOSE COMMITMENT (in mrem)		
			Whole Body	Bone	Lung
Off-Site Nearest Residence - S	U-nat.	= 0.0142	0.0656	1.13	2.40
	Ra-226	= 0.0080	0.247	2.47	52.9
	Th-230	= 0.0085	1.41	50.6	27.4
	Pb-210	= 0.0536	0.234	7.24	41.4
	TOTAL	=	1.96	61.4	124
Off-Site Nearest Residence - N	U-nat.	= 0.0084	0.0388	0.667	1.42
	Ra-226	= 0.0052	0.161	1.61	34.4
	Th-230	= 0.0031	0.515	18.4	9.98
	Pb-210	= 0.0460	0.201	6.21	35.5
	TOTAL	=	0.915	26.9	81.3

DOSE CONVERSION FACTORS FOR THE INHALATION OF AIRBORNE PARTICULATES (MilliRem per pCi/m^3)*

Radionuclide	Whole Body	Bone	Lung
U-238	4.32	79.2	158
U-234	4.92	79.5	180
U-natural	4.62	79.4	169
Th-230	166	5950	3220
Ra-226	30.9	309	6110
Pb-210	4.36	135	772
Po-210	0.47	1.92	420

*The 50-year dose commitment for each year of exposure to 1 pCi/m^3 of each radionuclide for an adult breathing rate of 20 m^3/day. Particle size of 1.55 μm AMAD (i.e., mean diameter of 1 μm and density of 2.4 g/cm^3) being representative of uranium ore. The Quality Factor for alpha radiations is 10. The total dose per organ is the summation of doses due to each radionuclide. (Regulatory Guide RH#802-4).

EXAMPLE EMP MODIFICATIONS

- INVENTORY OF SOURCES
  - IDENTIFY MINING AREAS, ORE STORAGE PADS, TRANSPORTATION ROUTES, ETC.

- ESTABLISH SUPPLEMENTAL AIR PARTICULATE SAMPLING STATION
  - SHORT TERM SAMPLING
  - LIMITED ANALYSIS
  - CORRELATION OF METEORLOGICAL DATA

- REVIEW DATA

- RE-EVALUATION OF DOSE ESTIMATES

PRELIMINARY DATA

COMPOSITE 50-YEAR DOSE COMMITMENTS TO THE INDIVIDUAL RECEIVING MAXIMUM EXPOSURE, FOR ONE YEAR, FOR EACH MILLING FACILITY

Facility	Composite Dose Commitments, mrem: Whole Body	Bone	Lung	Date and Method of Dose Prediction	Reference
1	2.4	74.8	34.6	January 1979, UDAD and HERMES Codes	FES NUREG-0453 Table 4.4
2	.486	6.14	.782	July 1979, MILDOS Code	IEA Table 4 (REF ##)
3	1.22	15.0	6.83	September 1980, MILDOS Code	Appendix 6
4	.799	17.5	22.3	September 1980 MILDOS Code	Appendix 2
5	2.37	16.0	3.22	May 1979, UDAD Code	FES NUREG-0556 Table 4.6
6	.0081	.0831	.038	July 1979, MILDOS Code	Appendix 6
7	1.58	22.7	9.2	September 1980, MILDOS Code	Appendix 1
8	.914	14.5	9.34	September 1980, MILDOS Code	Appendix 3
9	.709	10.4	5.35	September 1980, MILDOS Code	Appendix 4
10	1.57	8.98	8.09	July 1979, UDAD Code	FES NUREG-0583, Table 4.5
11	1.96	45.0*	61.1*	September 1980*, MILDOS Code	Appendix 5
12	0.97	1.81	12.4	July 1980, MILDOS Code	FES NUREG-0702 Table 4.6
13	.08	.34	.28	February 1979, UDAD and HERMES Codes	FES NUREG-0532, Table 4.2
14	2.0	11.5	24.2	February 1980, UDAD and HERMES Codes	FES NUREG-0639 Table 4.9

*Based on overestimate of source terms in initial computer run. Being rerun; expect at least 50% reduction in estimated levels.

PRELIMINARY DATA

DIRECT EXPOSURE AND INGESTION EXPOSURE PATHWAYS DOSE COMMITMENTS FOR EACH MILLING FACILITY

Facility	Location of Individual Receiving Maximum Direct Exposure Dose	Direct Exposure Dose Commitment, mrem			Location Corresponding to Maximum Ingestion Dose	Ingestion Exposure Dose Commitment, mrem		
		Whole Body	Bone	Lung		Whole Body	Bone	Lung
1	8 km E	2.0	74.4	29.6	Grazing 2.7 km SE-Meat	.4	.4	5.0
2	716 km NE	.020	.373	.316	Veg.+Grazing 1.4 km NE-Meat	.466	5.77	.466
3	4.3 km NE	.107	3.26	5.72	Grazing, .5 km W	1.11	11.7	1.11
4	.55 km WNW	.421	12.8	21.9	Grazing 1.24 km NE-Meat	.378	4.71	.378
5	.5 km NNE	1.03	1.99	1.88	4.5 km NNE-Veg + 1.9 km N-Meat	1.34	14.0	1.34
6	35 km NE	.0021	.0071	.032	Grazing 2.5 km NE-Meat	.006	.076	.006
7	3.1 ENE	.179	5.22	7.79	Grazing 1.9 km NE-Meat	1.4	17.5	1.4
8	4.8 km E	.176	5.24	8.6	Grazing 1.81 km NNW-Meat	.738	9.21	.738
9	3.2 km S	.091	2.77	4.73	Grazing 1.68 km NE-Meat	.618	7.65	.618
10	5.6 km N	.830	4.31	7.35	4.2 km SSW Meat + Veg	.738	7.67	.738
11	2.5 km NW	1.11	34.3*	60.2*	Grazing .4 km SE	.852	10.7*	.852*
12	8.7 km NE	.03	.65	.87	Veg. + 1.4 km ENE-Meat	0.94	11.7	0.94
13	10 km N	.06	.08	.26	Veg. + 13 km NW-Meat	.02	.26	.02
14	2 km N	Unavailable			Veg. + grazing 2.7 km ENE-Meat	Unavailable		

*Based on overestimate of source terms in initial computer run. Being rerun; expect at least 50% reduction in estimated levels.

TABLE 2

OPERATIONAL RADIOLOGICAL MONITORING PROGRAM FOR URANIUM MILLS

Type of Sample	Sample Collection				Sample Analysis	
	Number	Location	Method	Frequency	Frequency	Type of Analysis
STACKS						
Particulates	One for each stack	Yellowcake dryer and packaging stack(s)	Isokinetic	Quarterly	Each sample	Natural uranium, Th-230, Ra-226, and Pb-210 if not available from other sources. Measure stack flow rate semiannually.
Particulates	One for each stack	Other stacks	Representative grab	Semiannually	Each sample	Natural uranium Th-230, Ra-226, and Pb-210. Measure stack flow.
AIR						
Particulates	Three	Locations at or near the site boundaries and in different sectors that have the highest predicted concentrations of airborne particulates[b]	Continuous[a]	Weekly filter change, or more frequently as required by dust loading	Quarterly composite, by location, of weekly samples	Natural uranium, Ra-226, Th-230, and Pb-210
	One or more	At the nearest residence(s) or occupiable structure(s)	Continuous	Weekly filter change, or more frequently as required by dust loading	Quarterly composite, by location, of weekly samples	Natural uranium, Ra-226, Th-230, and Pb-210
	One	Control location(s)[c]	Continuous	Weekly filter change, or more frequently as required by dust loading	Quarterly composite, by location, of weekly samples	Natural uranium, Ra-226, Th-230, and Pb-210
Radon Gas	Five or more	Same locations as for air particulates	Continuous or at least one week per month[d]	At least one week per calendar month representing approximately the same period each month	Monthly	Rn-222
WATER						
Ground Water	Three or more	Hydrologically down gradient and relatively close to the tailings impoundment[f]	Grab	Monthly (first year) Quarterly (after first year)	Monthly (first year) Quarterly (after first year)	Dissolved natural uranium, Ra-226, Th-230, Pb-210, and Po-210[e]
	At least one control sample	Hydrologically up gradient (i.e., not influenced by seepage from tailings)	Grab	Quarterly	Quarterly	Dissolved natural uranium, Ra-226, Th-230, Pb-210 and Po-210

TABLE 2 (Continued)

OPERATIONAL RADIOLOGICAL MONITORING PROGRAM FOR URANIUM MILLS

Type of Sample	Sample Collection				Sample Analysis	
	Number	Location	Method	Frequency	Frequency	Type of Analysis
	One from each well	Each well used for drinking water or watering of livestock or crops within 2 km of the tailings impoundment	Grab	Quarterly	Quarterly	Dissolved and suspended natural uranium, Ra-226, Th-230, Pb-210, and Po-210
Surface Water	Two from each water body	Surface waters passing through the mill site or offsite surface waters that are sufficiently close to the site to be subject to surface drainage from potentially contaminated areas or that could be influenced by seepage from the tailings disposal area.(b) One sample collected upstream of mill site and one sample collected at the downstream site boundary or at a location immediately downstream of location of potential influence	Grab	Quarterly	Quarterly	Dissolved and suspended natural uranium, Ra-226, Th-230, Pb-210, and Po-210(g)
	One from each water body	Large water impoundments (i.e., lakes, reservoirs) near the mill site that are sufficiently close to the site to be subject to drainage from potentially contaminated areas or that could be influenced by seepage from the tailings disposal area.	Grab	Quarterly	Quarterly	Dissolved and suspended natural uranium, Ra-226, Th-230, Pb-210, and Po-210
VEGETATION, FOOD, AND FISH						
Vegetation or Forage(o)	Three or more	From animal grazing areas near the mill site in the direction of the highest predicted airborne radionuclide concentrations	Grab	Three times during grazing season	Each sample	Ra-226 and Pb-210

TABLE 2 (Continued)

OPERATIONAL RADIOLOGICAL MONITORING PROGRAM FOR URANIUM MILLS

Type of Sample	Sample Collection				Sample Analysis	
	Number	Location	Method	Frequency	Frequency	Type of Analysis
Food	Three of each type	Crops, livestock, etc. raised within 3 km of mill site	Grab	Time of harvest or slaughter	Once	Ra-226 and Pb-210
Fish	Each body of water	Collection of fish (if any) from lakes, rivers, and streams in the site environs that may be subject to seepage or direct surface runoff from potentially contaminated areas or that could be affected by a tailings impoundment failure	Grab	Semiannually	Twice	Ra-226 and Pb-210
SOIL AND SEDIMENT						
Soil	Five or more	Same as for air particulate samples[k]	Grab	Annually	Annually	Natural uranium, Ra-226, and Pb-210
Sediment	One or two from each water body	Same as surface water samples[m]	Grab	Annually	Annually	Natural uranium, Th-230, Ra-226, and Pb-210
DIRECT RADIATION	Five or more	Same as for air particulate samples	Continuous passive integrating device	Quarterly change of passive dosimeters	Quarterly	Gamma exposure rate

Footnotes for Tables 1 and 2:

(a) Continuous collection means continuous sampler operation with filter change weekly or as required by dust loading, whichever is more frequent.

(b) The term "nearest" as used here means the location with the highest predicted airborne radionuclide concentrations during milling operations.

(c) Care should be taken in selection of the control sampling location so that it is representative of the site conditions. In general, a location in the least prevalent wind direction from the site should provide a suitable location for a control sampling site.

(d) Various methods are acceptable; for example: (1) Continuous collection of a gaseous air sample with samples being changed about every 48 hours for a 1-week period or (2) continuous sampling.

(e) If the sample contains appreciable suspended material, it should be filtered as soon as possible following collection through a membrane filter and the filtrate acidified to 1% hydrochloric acid.

(f) The location of the ground-water sampling wells should be determined by a hydrological analysis of the potential movement of seepage from the tailings disposal area. In general, the objective is to place monitor wells in all directions around the tailings area with the emphasis on the down gradient locations.

(g) Surface-water samples to be analyzed for dissolved and suspended fractions should be filtered as soon as possible following collection through a membrane filter and the filtrate acidified to 1% hydrochloric acid.

(h) Natural drainage systems (dry washes) that carry surface runoff from the site following a precipitation event should be sampled following the event but at a frequency not greater than monthly.

(i) The milling area refers to the area that includes ore storage pads, mill buildings, and other processing areas.

(j) Thermoluminescent dosimeters should contain two or more chips or otherwise provide for two readings per exposure period (see Regulatory Guide 4.13).

(k) Surface soil samples should be collected using a consistent technique to a depth of 5 cm.

(l) Subsurface soil profile samples should be collected to a depth of one meter. Samples should be divided into three equal sections for analysis.

(m) Several samples should be collected at each location and composited for a representative sample.

(n) Radon exhalation measurements should not be taken during periods when the ground is frozen or covered with ice or snow or following periods of rain. It is recommended that these measurements be taken in the spring through the fall during normal weather conditions.

(o) Vegetation or forage sampling need be carried out only if dose calculations indicate that the ingestion pathway from grazing animals is a potentially significant exposure pathway (an exposure pathway should be considered important if the predicted dose to an individual would exceed 5% of the applicable radiation protection standard).

TABLE 3[a]

SAMPLE FORMAT FOR REPORTING MONITORING DATA

1. STACK SAMPLES

For each sample analyzed, report the following information:

a. Date sample was collected
b. Location of sample collection
c. Stack flow rate (m^3/sec)

Radionuclide	Concentration (μCi/ml)	Error Estimate[b] (μCi/ml)	Release Rate (Ci/qr)	Error Estimate (Ci/qr)	LLD[c] (μCi/ml)	% MPC[c]
U-nat						
Th-230						
Ra-226						
Pb-210						

2. AIR SAMPLES

For each sample analyzed, report the following information:

a. Date sample was collected
b. Location of sample collection

Radionuclide	Concentration (μCi/ml)	Error Estimate (μCi/ml)	LLD (μCi/ml)	% MPC
U-nat				
Th-230				
Ra-226				
Pb-210				
Rn-222				

[a] This table illustrates format only. It is not a complete list of data to be reported. (See text of guide and Tables 1 and 2.)

[b] Error estimate should be calculated at 95% uncertainty level, based on all sources of random error, not merely counting error. Significant systematic error should be reported separately. See Sections 6.1, 7.1.4, and 7.3.

[c] All calculations of lower limits of detection (LLD) and percentages of maximum permissible concentration (MPC) should be included as supplemental information.

TABLE 3 (Continued)

SAMPLE FORMAT FOR REPORTING MONITORING DATA

3. LIQUID SAMPLES

For each sample analyzed, report the following information:

a. Date sample was collected
b. Location of sample collection
c. Type of sample (for example: surface, ground, drinking, stock, or irrigation)

Radionuclide	Concentration (μCi/ml)	Error Estimate (μCi/ml)	LLD (μCi/ml)
U-nat (dissolved)			
U-nat (suspended)[d]			
Th-230 (dissolved)			
Th-230 (suspended)[d]			
Ra-226 (dissolved)			
Ra-226 (suspended)[d]			
Pb-210 (dissolved)			
Pb-210 (suspended)[d]			
Po-210 (dissolved)			
Po-210 (suspended)[d]			

4. VEGETATION, FOOD, AND FISH SAMPLES

For each sample analyzed, report the following information:

a. Date sample was collected
b. Location of sample collection
c. Type of sample and portion analyzed

Radionuclide	Concentration (μCi/kg wet)	Error Estimate (μCi/kg)	LLD (μCi/kg)
U-nat			
Th-230			
Ra-226			
Pb-210			
Po-210			

[d] But all samples must be analyzed for suspended radionuclides. See Sections 1.2 and 2.2 of this guide.

TABLE 3 (Continued)

SAMPLE FORMAT FOR REPORTING MONITORING DATA

5. SOIL AND SEDIMENT SAMPLES

For each sample analyzed, report the following information:

a. Date sample was collected
b. Location of sample collection
c. Type of sample and portion analyzed

Radionuclide	Concentration (μCi/g)	Error Estimate (μCi/g)	LLD (μCi/g)
U-nat			
Th-230			
Ra-226			
Pb-210			
Po-210			

6. DIRECT RADIATION MEASUREMENTS

For each measurement, report the dates covered by the measurement and the following information:

Location	Exposure Rate (mR/qr)	Error Estimate (mR/qr)

7. RADON FLUX MEASUREMENTS

For each measurement, report the dates covered by the measurement and the following information:

Location	Flux (pCi/m^2-sec)	Error Estimate (pCi/m^2-sec)

4.1-10