December 23, 1991

SUBJECT: Offsite Dose Calculation Manual - Oconee Section
Revision 32

The General Offsite Radwaste Processing & Management Staff is transmitting to you this date, Revision 32 of the Offsite Dose Calculation Manual. As this revision only affects Oconee Nuclear Station, the approval of other station managers is not required. Please update your copy No. 51, and discard the affected pages.

Instructions:

Please replace the entire contents of Section "A" with the attached package.

NOTE: As this letter, with its attachments, contains "LOEP" information, please insert this letter in front of the December 28, 1990 letter.

Approval Date: 12/31/91

Effective Date: 1/1/92

G L Courtney /by amf

G. L. Courtney
Radiation Protection Manager

Approval Date: 12-31-91

Effective Date: 1/1/92

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APPENDIX A

OCONEE NUCLEAR STATION

SITE SPECIFIC INFORMATION

APPENDIX A-TABLE OF CONTENTS

A1.0 OCONEE NUCLEAR STATION RADWASTE SYSTEMS

A1.1 LIQUID RADWASTE PROCESSING

The liquid radwaste system at Oconee Nuclear Station (ONS) is used to collect and treat fluid chemical and radiochemical by-products of unit operation. The systems produce effluents which can be reused in the plant or discharged in small, dilute quantities to the environment. The means of treatment vary with waste type and desired product in the various systems:

A) Filtration - waste sources are filtered prior to processing as necessary.

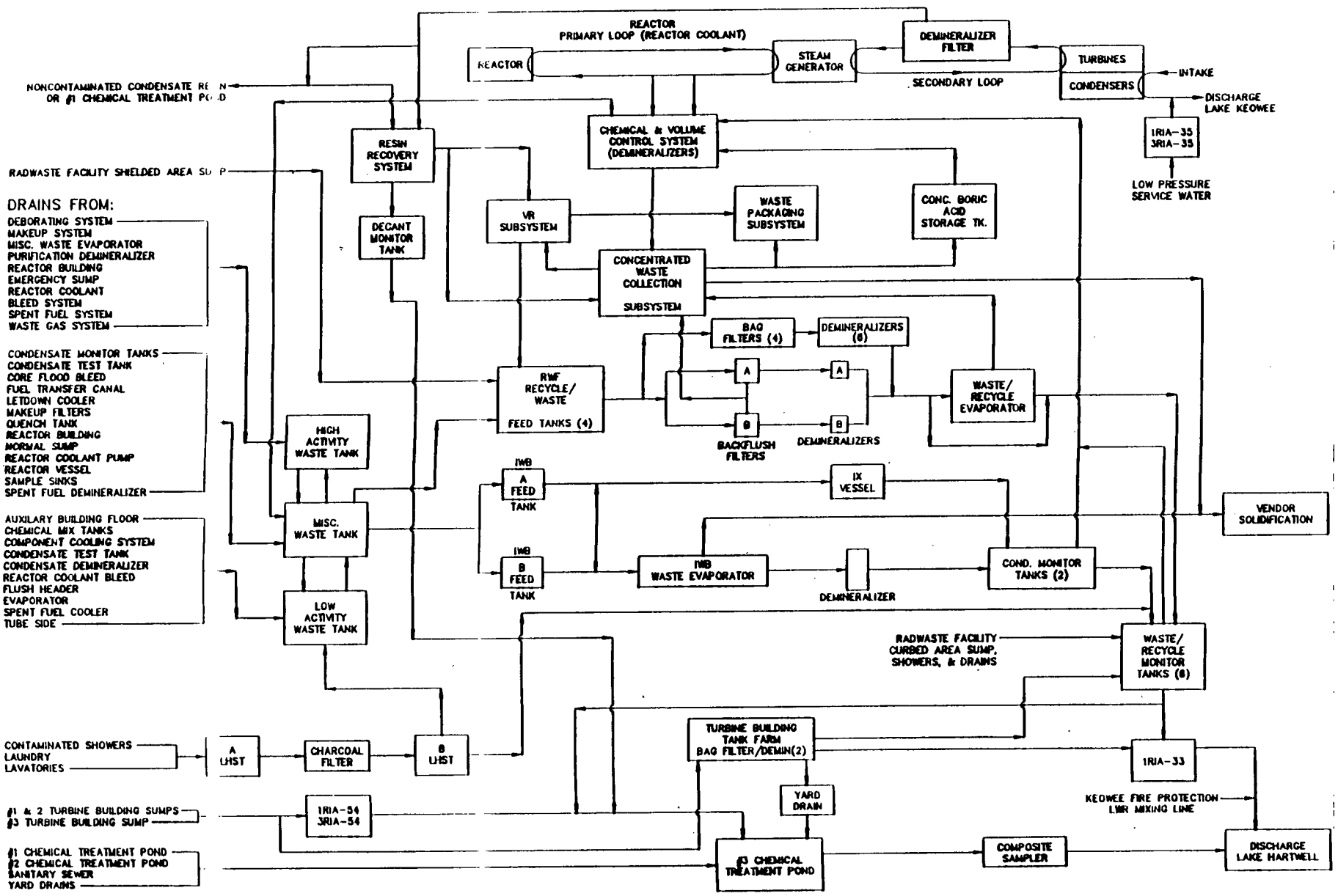
B) Ion Exchange - ion exchange is used to remove radioactive ions from solution. Also, ion exchange is normally used in removing cations (cobalt, manganese) and anions (chloride, fluoride) from evaporator feed and/or distillates in order to purify the distillates for reuse as makeup water. Distillate from the Waste Evaporator System or the Waste and Recycle Evaporator can be treated by this method.

C) Gas Stripping - removal of gaseous radioactive fission products is accomplished in Evaporators and the venting of atmospheric holdup tanks.

D) Distillation - production of pure water from the waste by boiling it away from the contaminated solution which originally contained it is accomplished by both evaporators. Proper control of the process will yield water which can be reused for makeup. Polishing of this product can be achieved by ion exchange as indicated above.

E) Concentration - in all Evaporators, radioactivity and dissolved chemicals are concentrated as water is boiled away. In the case of the Waste Evaporator, the volume of water containing waste chemicals and radionuclides is reduced so that the waste may be more easily and economically solidified and shipped for burial. In the case of the VR dryer, all water is removed and the dry salts are solidified for burial.

Figure A1.0-1 is a schematic representation of the liquid radwaste system at Oconee.



LIQUID RADWASTE SYSTEM
OCONEE NUCLEAR STATION
FIGURE A1.0-1

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A1.2 GASEOUS WASTE PROCESSING

The purpose of the gaseous waste disposal system is to:

(1) Maintain a non-oxidizing cover gas of nitrogen in tanks and equipment that contain potentially radioactive gas,

(2) Hold up radioactive gas for decay, and

(3) Release gases (radioactive or non-radioactive) to the atmosphere under controlled conditions.

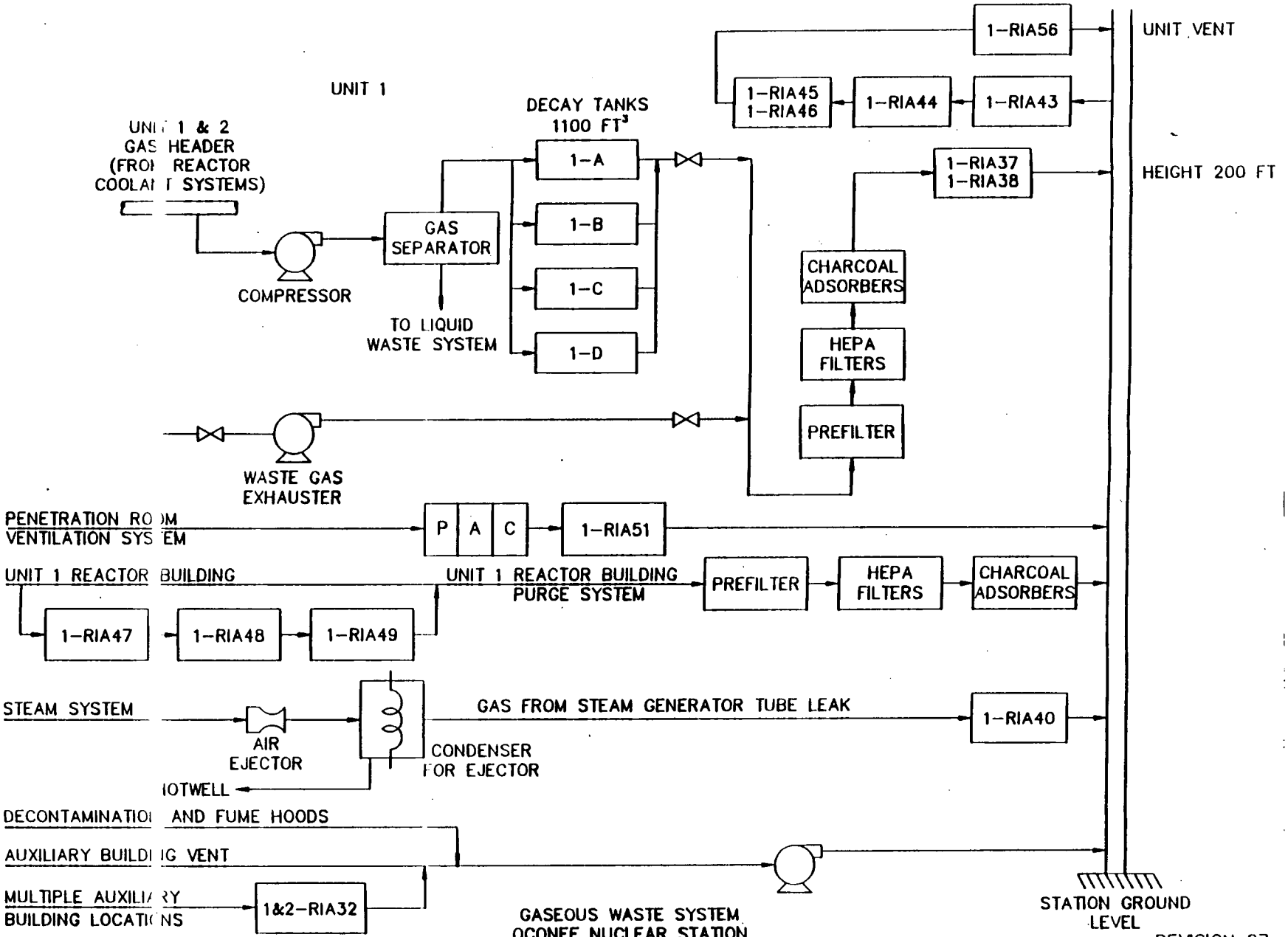
During power operation of the facilities, radioactive materials released to the atmosphere in gaseous effluents include low concentrations of fission product noble gases (krypton and xenon), halogens (mostly iodines), tritium contained in water vapor and particulate material including both fission products and activated corrosion products.

The primary source of gaseous radioactive wastes is from the degassing of the primary coolant during letdown of the cooling water into the various holding tanks. Additional sources of gaseous waste activity include the auxiliary building exhaust, spent fuel area exhaust, the discharge from the steam jet air ejectors, purging and venting of the reactor containment building.

All components that can contain potentially radioactive gases are vented to a vent header. The vent gases are subsequently drawn from this vent header by one of four waste gas compressors or a waste gas exhauster. The waste gas compressor discharges through a waste gas separator to one of seven waste gas tanks. The waste gas tanks and the waste gas exhauster discharge to the unit vent after passing through a filter bank consisting of a prefilter, an absolute filter, and a charcoal filter.

Radioactive gases may be released inside the reactor containment building when components of the primary system are opened to the building atmosphere for operational reasons or where minor leaks occur in the primary system. Prior to access, the reactor containment atmosphere will be monitored for activity and, when necessary, purged through prefilters, high-efficiency particulate air (HEPA) filters and charcoal adsorbers and released to atmosphere through the unit vent. The purge equipment is sized for a flow rate of 50,000 cfm providing approximately 1.5 air changes per hour in the reactor building. Units 1, 2 & 3 have a separate vent stack from each reactor building.

The gaseous waste handling and treatment systems for the Oconee Nuclear Station are shown schematically in Fig. A1.0-2.



GASEOUS WASTE SYSTEM
OCONEE NUCLEAR STATION
FIGURE A1.0-2
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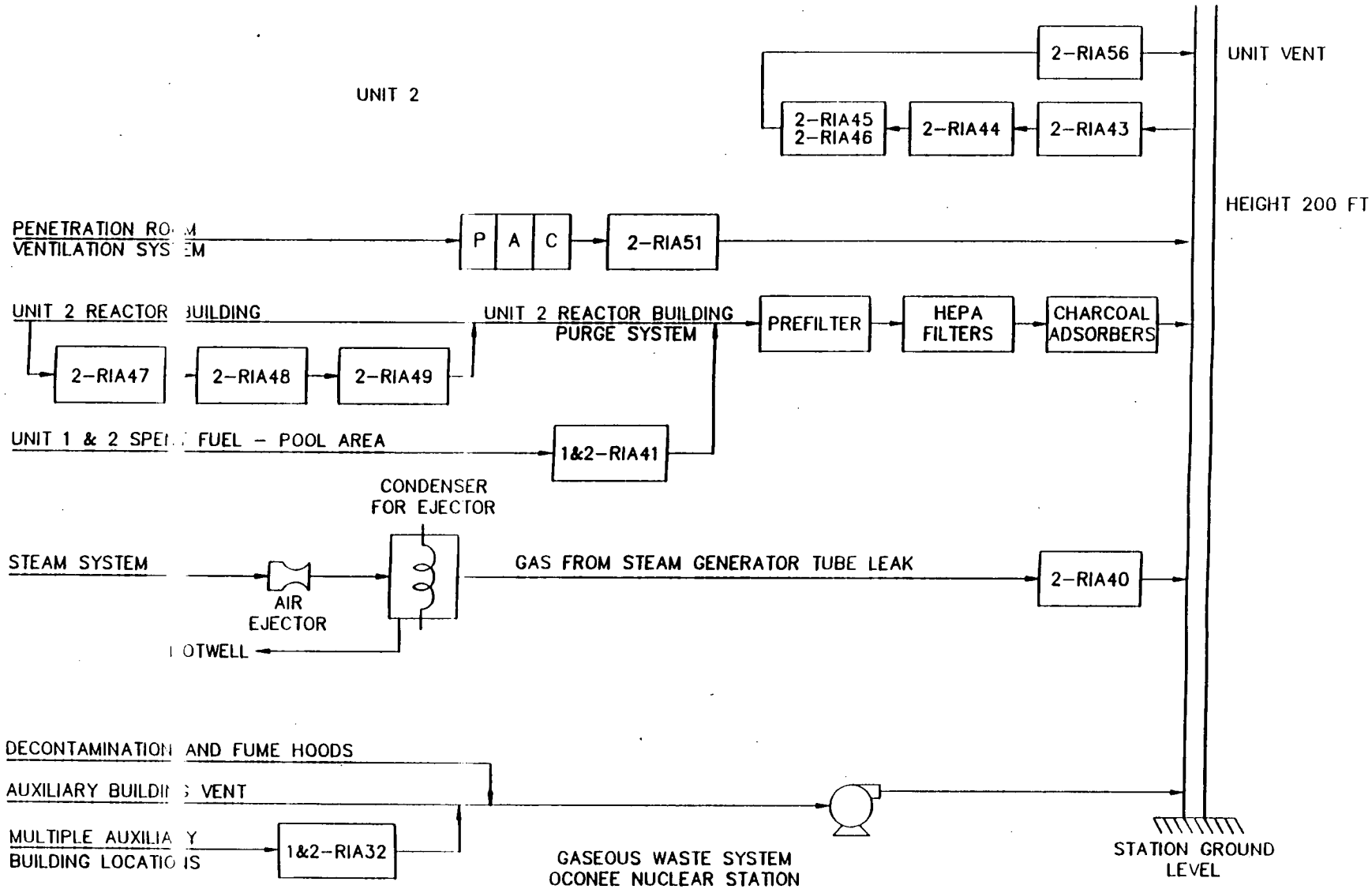

GASEOUS WASTE SYSTEM
OCONEE NUCLEAR STATION
FIGURE A1.0-2
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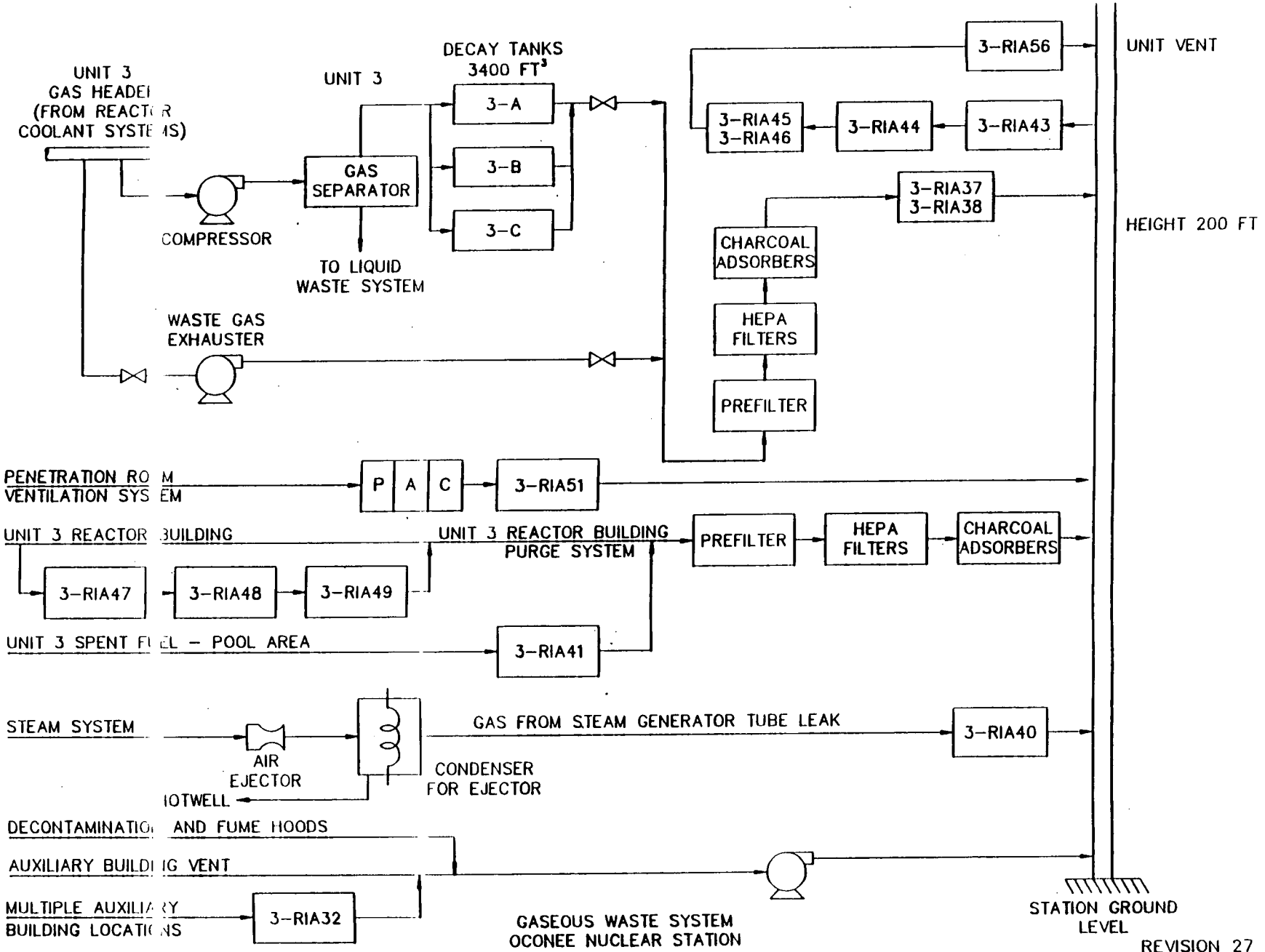

GASEOUS WASTE SYSTEM
OCONEE NUCLEAR STATION
FIGURE A1.0-2
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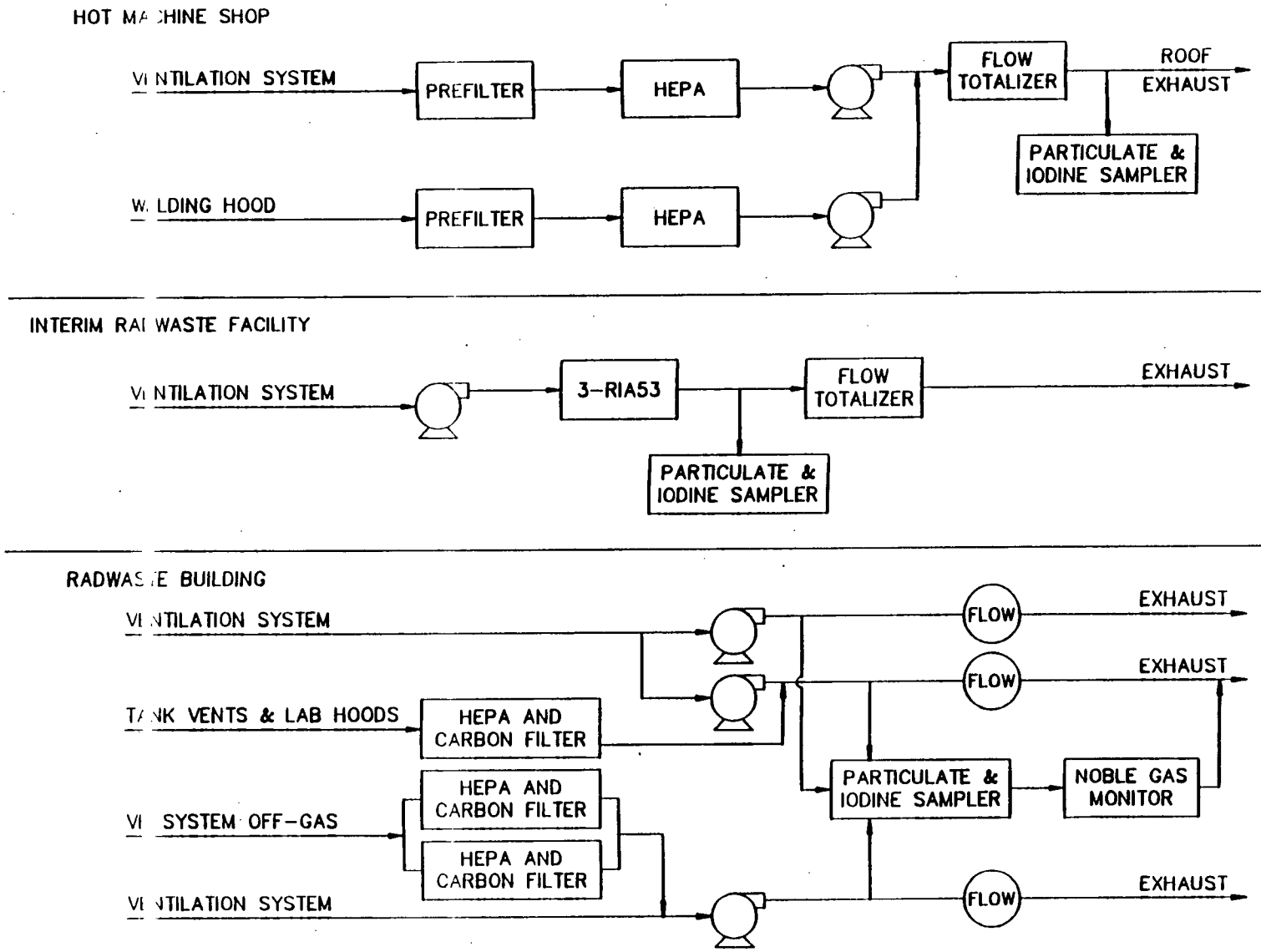

GASEOUS WASTE SYSTEM
OCONEE NUCLEAR STATION
FIGURE A1.0-2
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A2.0 RELEASE RATE CALCULATION

Generic release rate calculations are presented in Section 1.0; these calculations will be used to calculate release rates from Oconee Nuclear Station.

A2.1 LIQUID RELEASE RATE CALCULATIONS

There are two potential release points at Oconee, the liquid radwaste effluent line to the Keowee Hydroelectric Unit Tailrace and the #3 Chemical Treatment Pond effluent line to the Keowee River.

A2.1.1 Liquid Radwaste Effluent Line To The Keowee Hydroelectric Unit Tailrace

To simplify calculations for the liquid radwaste effluent line, it is assumed that no activity above background is present in the #3 Chemical Treatment Pond effluent. This assumption shall be confirmed by radiation monitoring and/or the sampling of the pond's radioactive inputs, and by periodic analysis of the composite sample collected at the #3 Chemical Treatment Pond discharge. For the liquid radwaste effluent line the following calculation shall be performed to determine a discharge flow, in gpm:

$$f \leq F \div \left[\sigma \sum_{i=1}^{n} \frac{C_i}{MPC_i}\right]$$

where:

f = the undiluted effluent flow, in gpm.

C_i = the concentration of radionuclide, 'i', in undiluted effluent as determined by laboratory analyses, in µCi/ml.

MPC_i = the concentration of radionuclide, 'i', from 10CFR20, Appendix B, Table II, Column 2. If radionuclide, 'i', is a dissolved noble gas, the MPC_i = 2.0E-4 µCi/ml.

F = the dilution flow available, in gpm

typical flow rates are:

3.41E+04 gpm (based on a leakage rate of 38 cfs, plus the Keowee Hydro Fire Protection - LWR mixing line whose flow rate is 38 cfs)

2.9E+6 gpm (based on one hydro unit operating at 50% power, 6600 cfs)

σ = the recirculation factor at equilibrium is 1.0. (See Section 1.1)

A2.1.2 #3 Chemical Treatment Pond Effluent Line

The #3 Chemical Treatment Pond effluent is the release point for station effluents that are normally considered to be non-radioactive; that is, the pond's effluent will not normally contain measurable activity above background. It is assumed that no activity is present in the effluent until indicated by radiation monitoring measurements on the pond's inputs and/or by periodic analyses of the composite sample collected at the pond's discharge point. Inputs to this pond include the plant's yard drain system, the decant water from the Powdex system, the discharge from the Turbine Building Sump system, and Radwaste Facility monitor tanks whose contents have been determined to be below background. Inputs that have radiation monitors associated with them will be set to assure that Selected Licensee Commitment 16.11-1.1 will not be exceeded.

The #3 Chemical Treatment Pond may also be the discharge path for large volumes of slightly contaminated water following a primary-secondary leak so long as administrative procedures are implemented to assure that release rate calculations similiar to that used in Section A2.1.1 are performed, that all detectable radionuclides will be accounted for, and that no station limits will be exceeded.

A2.1.3 Low Pressure Service Water Effluent Line

The Low Pressure Service water effluent is normally considered nonradioactive; that is, it is unlikely the effluent will contain measurable activity above background. It is assumed that no activity is present in the effluent until indicated by radiation monitoring measurements. Radiation monitoring alarm setpoints, in conjunction with administrative controls, assure that release limits are not exceeded.

A2.2 GASEOUS RELEASE RATE CALCULATIONS FOR SEMI-ELEVATED RELEASE POINTS

The unit vents are the release points for waste gas decay tanks, containment building purges, containment building vents, the condenser air ejector, and auxiliary building ventilation. The unit vent is treated as a semi-elevated release point. The applicable dispersion and deposition parameters are provided in Tables A4.0-1a and A4.0-1b respectively.

The condenser air ejector effluent is normally considered nonradioactive; that is, it is unlikely the effluent will contain measureable activity above background. It is assumed that no activity is present in the effluent until indicated by radiation monitoring measurements and by analyses of periodic samples collected from this source. Radiation monitoring alarm/trip setpoints in conjunction with administrative controls assure that release limits are not exceeded; see section on radiation monitoring setpoints.

The following calculations, when solved for flowrate, are the release rates for noble gases and for radioiodines, particulates and other radionuclides with half-lives greater than 8 days; the most conservative of release rates calculated in A2.2.1 and A2.2.2 shall control the release rates for a single release point.

A2.2.1 Release rate limit for noble gases:

$$\sum_i K_i \left[\overline{(X/Q)}\tilde{Q}_i\right] < 500 \text{ mrem/yr, and}$$

$$\sum_i (L_i + 1.1\, M_i) \left[\overline{(X/Q)}\tilde{Q}_i\right] < 3000 \text{ mrem/yr}$$

where the terms are defined below.

A2.2.2 Release rate limit for all radioiodines and radioactive materials in particulate form and radionuclides other than noble gases:

$$\sum_i P_i \left[W\, \tilde{Q}_i\right] < 1500 \text{ mrem/yr}$$

where:

K_i = The total body dose factor due to gamma emissions for each identified noble gas radionuclide, in mrem/yr per $\mu Ci/m^3$ from Table 1.2-1.

L_i = The skin dose factor due to beta emissions for each identified noble gas radionuclide, in mrem/yr per $\mu Ci/m^3$ from Table 1.2-1.

M_i = The air dose factor due to gamma emissions for each identified noble gas radionuclide, in mrad/yr per $\mu Ci/m^3$ from Table 1.2-1 (unit conversion constant of 1.1 mrem/mrad converts air dose to skin dose).

P_i = The dose parameter for radionuclides other than noble gases for the inhalation pathway, in mrem/yr per $\mu Ci/m^3$ and for the food and ground plane pathways in $m^2 \cdot$(mrem/yr) per $\mu Ci/sec$ from Table 1.2-2. The dose factors are based on the critical individual organ and most restrictive age group (child or infant).

$\tilde{Q}_i$ = The release rate of radionuclides, i, in gaseous effluent from all release points at the site, in μCi/sec.

$\overline{X/Q}$ = 4.1E-7 sec/m^3. The highest calculated annual average relative concentration for any area at or beyond the unrestricted area boundary. The location is the S sector @ 3.5 miles for semi-elevated releases.

W = The highest calculated annual average dispersion/deposition parameter for estimating the dose to an individual at a controlling location in the unrestricted area where the total inhalation, food and ground plane pathway dose resulting from combined ground level and semi-elevated releases is determined to be a maximum based on operational source term data, land use surveys, and NUREG 0133 guidance:

W = 3.6E-7 sec/m^3, for the inhalation pathway. The location is the Sector @ 5.0 miles.

W = 4.5E-10 m^{-2}, for the food and ground plane pathways. The location is the Sector @ 5.0 miles.

$Q_i = k_1 C_i f \div k_2 = 4.72E+02\ C_i f$

where:

C_i = the concentration of radionuclide, i, in undiluted gaseous effluent, in μCi/ml.

f = the undiluted effluent flow, in cfm

k_1 = conversion factor, 2.83E+04 ml/ft^3

k_2 = conversion factor, 6.0E+01 sec/min

A2.3 GASEOUS RELEASE RATE CALCULATIONS FOR GROUND LEVEL RELEASE POINTS

Hot Machine Shop Building ventilation exhaust, Radwaste Facility Exhaust, and Auxiliary Boiler releases are treated as ground-level release points. The applicable dispersion and deposition parameters are provided in Tables A4.0-2a and A4.0-2b respectively.

It is assumed that no activity is present in effluent from these sources until indicated by radiation monitoring measurements and by analyses of periodic samples collected from these sources. Radiation monitoring alarm/trip setpoints in conjunction with administrative controls assure that release limits are not exceeded; see section on radiation monitoring setpoints.

The following calculations, when solved for flowrate, are the release rates for noble gases and for radioiodines, particulates and other radionuclides with half-lives greater than 8 days; the most conservative of release rates calculated in A2.3.1 and A2.3.2 shall control the release rates for a single release point.

A2.3.1 Release rate limit for noble gases:

$$\sum_i K_i \left[\overline{(X/Q)}\tilde{Q}_i\right] < 500 \text{ mrem/yr, and}$$

$$\sum_i (L_i + 1.1\, M_i) \left[\overline{(X/Q)}\tilde{Q}_i\right] < 3000 \text{ mrem/yr}$$

where the terms are defined below:

A2.3.2 Release rate limit for all radioiodines and radioactive materials in particulate form and radionuclides other than noble gases:

$$\sum_i P_i \left[W\, \tilde{Q}_i\right] < 1500 \text{ mrem/yr}$$

where:

K_i = The total body dose factor due to gamma emissions for each identified noble gas radionuclide, in mrem/yr per $\mu Ci/m^3$ from Table 1.2-1.

L_i = The skin dose factor due to beta emissions for each identified noble gas radionuclide, in mrem/yr per $\mu Ci/m^3$ from Table 1.2-1.

M_i = The air dose factor due to gamma emissions for each identified noble gas radionuclide, in mrad/yr per $\mu Ci/m^3$ from Table 1.2-1 (unit conversion constant of 1.1 mrem/mrad converts air dose to skin dose).

P_i = The dose parameter for radionuclides other than noble gases for the inhalation pathway, in mrem/yr per $\mu Ci/m^3$ and for the food and ground plane pathways in $m^2 \cdot$(mrem/yr) per μCi/sec from Table 1.2-2. The dose factors are based on the critical individual organ and most restrictive age group (child or infant).

$\tilde{Q}_i$ = The release rate of radionuclides, i, in gaseous effluent from all release points at the site, in μCi/sec.

$\overline{X/Q}$ = 9.2E-6 sec/m^3. The highest calculated annual average relative concentration for any area at or beyond the unrestricted area boundary. The location is the S sector @ 1.0 miles for ground-level releases.

W = The highest calculated annual average dispersion/deposition parameter for estimating the dose to an individual at a controlling location in the unrestricted area where the total inhalation, food and ground plane pathway dose resulting from combined ground level and semi-elevated releases is determined to be a maximum based on operational and design basis source term data, land use surveys, and NUREG 0133 guidance:

W = 4.8E-07 sec/m^3, for the inhalation pathway. The location is the Sector @ 5.0 miles.

W = 5.7E-10 m^{-2}, for the food and ground plane pathways. The location is the Sector @ 5.0 miles.

$$\tilde{Q}_i = k_1 C_i f \div k_2 = 4.72E+02\ C_i f$$

where:

C_i = the concentration of radionuclide, i, in undiluted gaseous effluent, in μCi/ml.

f = the undiluted effluent flow, in cfm

k_1 = conversion factor, 2.83E+04 ml/ft^3

k_2 = conversion factor, 6.0E+01 sec/min

A3.0 RADIATION MONITOR SETPOINTS

Using the generic calculations presented in Section 2.0, final radiation monitoring setpoints are calculated for monitoring as required by the Selected Licensee Commitments.

All final effluent radiation monitors for Oconee are off-line. These monitors alarm on low flow; the minimum flow alarm level for the liquid monitors is 3 gallons per minute and for all gas monitors, except in the Radwaste Facility, is 7 standard cubic feet per minute. These monitors measure the activity in the liquid or gas volume exposed to the detector and are independent of flow rate if a minimum flow rate is assured. The Radwaste Facility gas monitors have a minimum flow alarm level of 2 standard cubic feet per minute and adjusts flow rate as the line flow changes.

Radiation monitoring setpoints calculated in the following sections are expressed in activity concentrations; in reality the monitor readout is in counts per minute, except for the Radwaste Facility gas monitor where its readout is in (μCi/ml). The relationship between concentration and counts per minute shall be established by station procedure using the following relationship: Station radiation monitor setpoint procedures which correlate concentration and counts per minute shall be based on the formula below and will be determined using the monitor's correlation graph. The correlation graph shows concentration (μCi/ml) vs. monitor reading (cpm) based on empirical data.

$$c = \frac{r}{2.22 \times 10e\ V}$$

where:

c = the gross activity, in μCi/ml
r = the count rate, in cpm
2.22 x 10 = the disintegration per minute per μCi
e = the counting efficiency, cpm/dpm
v = the volume of fluid exposed to the detector, in ml.

A3.1 LIQUID RADIATION MONITORS

A3.1.1 Liquid Radwaste Effluent Line To The Keowee Hydroelectric Unit Tailrace

As described in Section A2.1.1 of this manual on release rate calculations for the waste liquid effluent, the release is controlled by limiting the flow rate of effluent from the station. Although the release rate is flow rate controlled, the radiation monitor setpoint shall be set to terminate the release if the effluent activity should exceed that used to calculate the release rate. Also, a radiation monitor setpoint shall be set to alarm if the effluent activity should exceed that determined by laboratory analyses.

A3.1.2 Turbine Building Sump Discharge Line

As described in Section A2.1.2 of this manual on release rate calculations for the turbine building sump effluent, the effluent is normally considered nonradioactive; that is, it is unlikely the effluent will contain measurable activity above background. It is assumed that no activity is present in the effluent until indicated by radiation monitoring and by routine analysis of the composite sample collected at the #3 Chemical Treatment Pond. Since the system discharges automatically, the maximum system concentration, which also is the radiation monitor setpoint, is calculated to assure compliance with release limits.

A typical setpoint is calculated as follows:

$$c \leq \frac{MPC \times F}{\sigma f} = 4.5E\text{-}6\ \mu Ci/ml$$

where:

c = the gross activity in undiluted effluent, in μCi/ml.

f = the flow rate of undiluted effluent which may vary from 0-375 gpm, but is assumed to be 375 gpm.

MPC = 1.0E-07 μCi/ml, the MPC for an unidentified mixture.

σ = 1 (See Section A2.1.1)

F = the flow may vary from 38 to 6,600 cfs, but is conservatively estimated at 38 cfs (1.7E+04 gpm), the minimum flow available.

A3.1.3 Radwaste Facility Effluent Line To CTP #3

As described in Section A2.1.2 of this manual on release rate calculations, the Radwaste Facility Effluent is normally considered non-radioactive; that is, it is unlikely the effluent will contain measurable activity above background. It is assumed that no activity is present in the effluent until indicated by radiation monitoring and/or by routine analyses of the composite sample collected at the discharge of the #3 Chemical Treatment Pond. In order to assure that no activity is unknowingly discharged into the pond, the inputs to the Radwaste Facility Effluent Line are released in discrete batches where each batch is sampled for activity prior to release.

A3.1.4 Low Pressure Service Water Discharge Line

As described in Section A2.1.3 of this manual on release rate calculations for the Low Pressure Service water effluent, the effluent is normally considered nonradioactive; that is, it is unlikely the effluent will contain measurable activity above background. It is assumed that no activity is present in the effluent until indicated by radiation monitoring equipment. Since the system discharges automatically, the maximum system concentration which is also the radiation monitor setpoint, is calculated to assure compliance with release limits.

A typical monitor setpoint is calculated as follows:

$$C \leq \frac{MPC \times F}{\sigma f} = 1.16E\text{-}5\ \mu Ci/ml$$

where:

C = the gross activity in undiluted effluent, in μCi/ml.

f = the flow rate of undiluted effluent which may vary from 0 to 10,500 gpm but is assumed to be 10,500 gpm.

MPC = 1.0E-07 μCi/ml, the MPC for an unidentified mixture.

σ = recirculation factor for Lake Keowee, 1.02.

F = the flow rate of the condensate cooling water is based on having seven CCW pumps in operation, 1.24E+06 gpm. Should the number of operating pumps decrease, the setpoint must be recalculated.

A3.2 GASEOUS RADIATION MONITOR SETPOINTS FOR SEMI-ELEVATED RELEASE POINTS

The following equation shall be used to calculate final effluent noble gas radiation monitor setpoints based on Xe-133:

$$K(\overline{X/Q})\tilde{Q}_i < 500 \text{ mrem (See Section A2.2.1)}$$

$$\tilde{Q}_i = 4.72E+2\ C_i f \text{ (See Section A2.2.2)}$$

$$(K)(\overline{X/Q})(472)(C_i)(f) < 500$$

$$C_i < \frac{500}{(294)(4.1E-7)(472)} \div f$$

$$C_i < 8.79E+3/f$$

where:

C = the gross activity in undiluted effluent, in μCi/ml

f = the flow from the tank or building and varies for various release sources, in cfm

K = from Table 1.2-1 for Xe-133, 2.94E+2 mrem/yr per μCi/m³

$\overline{X/Q}$ = 4.1E-7 sec/m³, as defined in section A2.2.2.

A3.2.1 Gaseous Radwaste Effluent Line - Waste Gas Decay Tanks

As described in Section 2.2, the release is controlled by limiting the flow rate of the effluent from the station. Although the release rate is flow rate controlled, the radiation monitor setpoint shall be set to terminate the release if the effluent activity should exceed that determined by laboratory analyses and that used to calculate the release rate. A typical radiation monitor setpoint may be calculated as follows:

$$C < 8.79E+3/f = 2.93E+02\ \mu Ci/ml$$

where:

f = 30 cfm

A3.2.2 Unit Vent

As stated in Section A2.2, the unit vent is the release point for waste gas decay tanks, containment building purges, containment building vents, the condenser air ejector, and auxiliary building ventilation. Since all of these releases are through the unit vent, the radiation monitor on the unit vent may be used to assure that station release limits are not exceeded. Depending on the stack flow, a typical radiation monitor setpoint may be calculated as follows:

$$C < 8.79E+3/f = 9.25E-2 \ \mu Ci/ml$$

where:

f = 45,000 cfm (auxiliary building) + 50,000 cfm (containment purge) = 95,000 cfm

or

$$C < 8.79E+3/f = 1.95E-1 \ \mu Ci/ml$$

where:

f = 45,000 cfm (auxiliary building ventilation)

A3.3 GASEOUS RADIATION MONITOR SETPOINTS FOR GROUND-LEVEL RELEASE POINTS

The following equation shall be used to calculate final effluent noble gas radiation monitor setpoints based on Xe-133:

$$K(\overline{X/Q})\tilde{Q}_i < 500 \text{ mrem (See Section A2.2.1)}$$

$$\tilde{Q}_i = 4.72E+2\ C_i f \text{ (See Section A2.2.2)}$$

$$(K)(\overline{X/Q})(472)(C_i)(f) < 500$$

$$C_i < \frac{500}{(294)(9.2E-6)(472)} \div f$$

$$C_i < 3.92E+2/f$$

where:

C = the gross activity in undiluted effluent, in μCi/ml

f = the flow from the tank or building and varies for various release sources, in cfm

K = from Table 1.2-1 for Xe-133, 2.94E+2 mrem/yr per μCi/m³

$\overline{X/Q}$ = 9.2E-6 sec/m³, as defined in section A2.3.2.

A3.3.1 Interim Radwaste Building Ventilation Exhaust

Ventilation exhaust from the Interim Radwaste Building is considered a separate release point. This exhaust is normally considered non-radioactive; that is, it is possible but unlikely that the effluent will contain measurable activity above background. Since the exhaust is continuous, a maximum concentration of gases in the exhaust, which also is the radiation monitor setpoint, is calculated to assure compliance with release limits. A typical radiation monitor setpoint may be calculated as follows:

$$C < 3.92E+2/f = 2.67E-2\ \mu Ci/ml$$

where:

f = 1.47E+04 cfm

A3.3.1 Hot Machine Shop Building Ventilation Exhaust

Ventilation exhaust from the Hot Machine Shop is considered to be a separate release point. This filtered exhaust is sampled and analyzed for particulates and radioiodines to assure that the effluent released has not exceeded station release limits. Since it is assumed that no noble gases will be generated by machine shop work, no provision for monitoring noble gas releases are provided.

A3.3.2 Contaminated Oil Burning In Auxiliary Boiler

Contaminated oil may be burned in the auxiliary boiler which is not released through the unit vent and is considered a separate release point. The contaminated oil is filtered, mixed, and sampled to determine the total activity to be released and the allowable release (burn) rate.

By Selected Licensee Commitments, releases from the auxiliary boiler from incineration of contaminated oil must meet the instantaneous release rate for iodines and particulates given in Section A2.2.2. Also, the total dose due to these releases must be less than 0.1% of the allowable yearly dose from particulate gaseous effluents.

Doses from incineration of contaminated oil are calculated for all organs and all pathways using either the models provided in Section 3.1.2.2 of this manual or the GASPAR computer program. Cumulative doses are calculated quarterly at a minimum.

All the activity in the contaminated oil is assumed to be released during incineration and the total is added to the station's quarterly and annual release records.

A3.3.3 Radwaste Facility Ventilation and Process Gas Exhaust

The ventilation and process gas exhaust from the Radwaste Facility is considered a separate release point. This exhaust is sampled continuously for iodine and particulates and noble gases. This data is used in calculations to assure that the effluents released have not exceeded station release limits. A typical radiation monitor setpoint may be calculated as follows:

$$C < 3.92E+2/f = 3.02E-03\ \mu Ci/ml$$

where:

f = 129,700 cfm, The total combined ventilation and process gas exhaust flow.

A4.0 DOSE CALCULATIONS

A4.1 FREQUENCY OF CALCULATIONS

Dose contributions to the maximum exposed individual shall be calculated at least every 31 days, quarterly, semiannually and annually (or as required by technical specifications) using the methodology in the generic information sections or the LADTAP and GASPAR computer programs. Example input templates for Oconee LADTAP and GASPAR computer program calculations are provided in Figures A4.0-1 and A4.0-2. One of these methods shall also be used for any special reports.

Station long-term historical and dose projection calculations are periodically performed to determine the station's status with respect to meeting annual ALARA goals specified in the Oconee Nuclear Station Selected Licensing Commitment Manual. Such calculations are used to verify that adequate margin remains during a report period to allow normal station and radwaste system operation, including anticipated operational occurrences, for the remainder of the report period without exceeding applicable goals. Station dose projections can be performed using generic methodology, LADTAP and/or GASPAR, or simplified dose calculation methods presented in Section A4.3.

Dose calculations that are required for individual pre-release calculations, and/or abnormal releases shall not be calculated using simplified dose calculation methods. Station dose projections for these types and others that are known to vary from the station historical averages shall be calculated by using the methodology in the generic information sections or the LADTAP and/or GASPAR computer codes.

Fuel cycle dose calculations shall be performed annually or as required by special reports. Dose contributions shall be calculated using the methodology in the appropriate generic information sections or the LADTAP and GASPAR computer programs.

A4.2 DOSE MODELS FOR MAXIMUM EXPOSED INDIVIDUAL

A4.2.1 Liquid Effluents

Generic methodology for calculating liquid pathway exposures to the maximum exposed individual is presented in Section 3.1.1. Oconee site specific parameters to be used in the generic methodology are presented as follows:

A_{ait} = Tables A4.0-3 through A4.0-6

$F_1 = \frac{f\sigma}{F+f}$ (0.035 default for projections)

Where:

f = Oconee average liquid radwaste flow, gpm (1.8E+04 default for projections)

σ = Recirculation factor at equilibrium, 1.0

F = Oconee average dilution flow for period of interest, gpm (2.9E+05 default for projections - based on 1983 - 1990 worst-case annual average)

An input template for Oconee LADTAP computer program calculations is provided in Figure A4.0-1. The input template includes default dilution parameters. Radionuclide release input (Ci/period) and optional non-default dilution flow (CFS) parameters are necessary to perform LADTAP calculations to determine offsite dose impact from specific releases during the period that dilution flow is averaged over.

A4.2.2 Gaseous Effluents

A4.2.2.1 Noble Gases

Gamma Air and Beta Air Dose

Generic methodology for calculating noble gas airborne pathway gamma air (D_γ) and beta air (D_β) doses is presented in Section 3.1.2.1. Oconee site specific parameters to be used in the generic methodology are presented as follows:

Semi-elevated Releases

$(\overline{X/Q})$ = 4.1E-7 sec/m3. The highest calculated annual average relative concentration for any area at or beyond the unrestricted area boundary. The location is the S sector @ 3.5 miles for semi-elevated releases.

Ground Level Releases

$(\overline{X/Q})$ = 9.2E-6 sec/m3. The highest calculated annual average relative concentration for any area at or beyond the unrestricted area boundary. The location is the S sector @1.0 miles for ground level releases.

An input template for Oconee GASPAR computer program noble gas airborne pathway gamma air (D_γ) and beta air (D_β) dose calculations is provided in Figure A4.0-2. The input template includes the maximum Oconee site specific semi-elevated and ground level annual average relative concentration parameters. Radionuclide release input (Ci/period) and optional non-default relative concentration parameters are necessary to perform GASPAR calculations to determine offsite dose impact from specific releases.

A4.2.2.2 Radioiodines, Particulate, and Other Radionuclides with T 1/2 > 8 Days

Generic methodology for calculating airborne pathway maximum organ (D_{mq}) exposures to the maximum exposed individual is presented in Section 3.1.2.2. External exposure from deposited ground contamination and inhalation exposure pathways are considered to exist at all locations offsite. Food pathways (i.e., vegetable, meat and milk) are analyzed only at locations where site surveys have verified vegetable gardens, meat producing animals, or cow/goat milk producing animals exist, however. Therefore, the location of the maximum

individual may vary depending on the mixture and levels of radionuclides released during a period of time. Additionally, the critical (or limiting) age group and organ will vary based on the location (i.e., combination of dose pathways contributing dose) and mixture/level of radionuclide releases during the release period.

Performing calculations separately for semi-elevated and ground level release types and for all potential maximum locations, age groups and organs assures that a maximum location is identified and that a conservative estimate is obtained for maximum offsite dose impact to any organ or age group. Oconee site specific meteorological dispersion (X/Q) and deposition (D/Q) parameters and applicable terrestrial/food pathways for the potential maximum locations to be analyzed using generic methodology are presented in Table A4.0-7.

An input template for Oconee GASPAR computer program airborne pathway maximum organ (D_{mo}) dose calculations is provided in Figures A4.0-3 through A4.0-10. The input template includes the maximum Oconee site specific semi-elevated and ground level annual average meteorological parameters. Radionuclide release input (Ci/period) and optional non-default meteorological parameters and pathway applicability flags are necessary to perform GASPAR calculations to determine offsite dose impact from specific releases.

An alternative method for estimating offsite dose involves performing calculations for all offsite locations and comparing the combined semi-elevated and ground level release dose totals for each location to determine the maximum organ exposure. Table A4.0-8 provides site survey data indicating the applicable food pathways to be considered for each offsite location.

A4.3 SIMPLIFIED DOSE ESTIMATES

A4.3.1 Liquid Effluents

For dose estimates, a simplified calculation based on operational source term data is presented below. Updated operational source term data shall be used to revise these calculations as necessary.

$$D_{WB} = 7.37E5 \sum_{\ell=1}^{m} (F_\ell)(T_\ell)\ (C_{Cs\text{-}134} + 0.59\ C_{Cs\text{-}137})$$

where:

$7.37E5 = 1.14E+05\ (U_{aw}/D_w + U_{af}\ BF_i)\ DF_{ait}$ (1.25)

where:

$1.14E+05$ = 10pCi/μCi x 10^3ml/kg ÷ 8760 hr/yr

U_{aw} = 730 kg/yr, adult water consumption

D_w = 1.0, dilution factor from the near field area to the nearest possible potable water intake.

U_{af} = 21 kg/yr, adult fish consumption

BF_i = 2.00E+03, bioaccumulation factor for Cesium (Table 3.1-1)

DF_{ait} = 1.21E-04, adult, total body, ingestion dose factor (Table 3.1-2)

1.25 = factor derived from the assumption that 80% of dose is from Cs-134 and Cs-137 or 100% ÷ 80% = 1.25

where:

$F_\ell = \frac{f\sigma}{F + f}$

f = liquid radwaste flow, in gpm

σ = recirculation factor at equilibrium, 1.0

F = dilution flow, in gpm

and where:

T_ℓ = the length of time, in hours, over which $C_{Cs\text{-}134}$, $C_{Cs\text{-}137}$, and F_ℓ are averaged

$C_{Cs\text{-}134}$ = the average concentration of Cs-134 in undiluted effluent, in μCi/ml, during the time period considered.

$C_{Cs\text{-}137}$ = the average concentration of Cs-137 in undiluted effluent, in μCi/ml, during the time period considered.

0.59 = the ratio of the adult total body ingestion dose factors for Cs-134 and Cs-137 or 7.14E-05 ÷ 1.21E-04 = 0.59

A4.3.2 Gaseous Effluents From Semi-Elevated Release Points

Meteorological data for Unit Vent releases is provided in Tables A4.0-1a and A4.0-1b.

A4.3.2.1 Noble Gases

For dose estimates, simplified dose calculations based on operational source term data are presented below. Updated operational source term data shall be used to revise those calculations as necessary. These calculations further assume that the annual average dispersion parameter is used and that Xenon-133 contributes 63% of the gamma air dose and 78% of the beta air dose for semi-elevated releases.

$$D_{\gamma} = 2.91E\text{-}12 \left[\tilde{Q} \right]_{Xe\text{-}133} \quad (1.59)$$

$$D_{\beta} = 8.65E\text{-}12 \left[\tilde{Q} \right]_{Xe\text{-}133} \quad (1.28)$$

where:

2.91E-12 = (3.17E-8) (353) ($\overline{X/Q}$), derived from equation presented in Section 3.1.2.1.

8.65E-12 = (3.17E-8) (1050) ($\overline{X/Q}$), derived from equation presented in Section 3.1.2.1.

$\left[\tilde{Q} \right]_{Xe\text{-}133}$ = the total Xenon-133 activity released in μCi

$\overline{X/Q}$ = 2.60E-7 sec/m³, the semi-elevated release dispersion parameter ($\overline{X/Q}$) corresponding to the controlling location (S @ 1.0 miles). The controlling location is the location in the unrestricted area where the total noble gas dose from combined semi-elevated and ground level releases is determined to be a maximum. This location is not controlling for semi-elevated release calculations performed separately (see Section A4.2.2.1).

1.59 = factor derived from the assumption that 63% of the Gamma Air dose is contributed by Xe-133

1.28 = factor derived from the assumption that 78% of the Beta-Air dose is contributed by Xe-133

A4.3.2.2 Radioiodines, Particulates, and Other Radionuclides with T 1/2 > 8 Days

For dose estimates, simplified dose calculations based on operational source term data are presented below. Updated operational source term data shall be used to revise these calculations as necessary. These calculations further assume that the annual average dispersion/deposition parameter is used and that 86% of the semi-elevated release dose results from Iodine-131 ingested by the maximally exposed individual via the goat milk pathway at the controlling location. The simplified dose estimate for exposure to the thyroid of an infant is:

$$D = 1.83E4\ W\ (\tilde{Q})_{I\text{-}131}\ (1.16)$$

where:

W = 4.5E-10, the semi-elevated release deposition parameter ($\overline{D/Q}$) for food and ground plane pathway, in m^{-2} corresponding to the controlling location (S @ 5.0 miles).

$(\tilde{Q})_{I\text{-}131}$ = the total Iodine-131 activity released in μCi.

1.83E4 = (3.17E-08) (R^{G}_{i} [$\overline{D/Q}$]) with the appropriate substitutions for the goat milk pathway factor, R^{C}_{i} [$\overline{D/Q}$], for Iodine-131. See Section 3.1.2.2.

1.16 = factor derived from the assumption that 86% of the total inhalation, food and ground plane pathway dose to the maximally exposed individual is contributed by I-131 via the goat milk pathway.

A4.3.3 Gaseous Effluents From Ground-Level Release Points

Meteorological data for Hot Machine Shop Building Ventilation exhaust, Radwaste Facility exhaust, and Interim Radwaste Building releases is provided in Tables A4.0-2a and A4.0-2b.

A4.3.3.1 Noble Gases

For dose estimates, simplified dose calculations based on operational basis source term data are presented below. These calculations further assume that the annual average dispersion parameter is used and that Xenon-133 contributes 56% of the gamma air dose and 75% of the beta air dose for ground-level releases.

$$D_{\gamma} = 1.03E\text{-}10\ [\ \tilde{Q}\ ]_{Xe\text{-}133}\ (1.79)$$

$$D_{\beta} = 3.06E\text{-}10\ [\ \tilde{Q}\ ]_{Xe\text{-}133}\ (1.33)$$

where:

1.03E-10 = (3.17E-8) (353) $(\overline{X/Q})$, derived from equation presented in Section 3.1.2.1.

3.06E-10 = (3.17E-8) (1050) $(\overline{X/Q})$, derived from equation presented in Section 3.1.2.1.

$[\tilde{Q}]_{Xe\text{-}133}$ = the total Xenon-133 activity released in μCi

$\overline{X/Q}$ = 9.2E-6 sec/m³, the ground level release dispersion parameter $(\overline{X/Q})$ corresponding to the controlling location (S @ 1.0 miles). The controlling location is the location in the unrestricted area where the total noble gas dose from combined semi-elevated and ground level reases is determined to be a maximum. This location is <u>also</u> the controlling location for ground level release calculations performed separately (see Section A4.2.2.1).

1.79 = factor derived from the assumption that 56% of the Gamma Air dose is contributed by Xe-133

1.33 = factor derived from the assumption that 75% of the Beta-Air dose is contributed by Xe-133

A4.3.3.2 Radioiodines, Particulates, and Other Radionuclides with T 1/2) 8 Days

For dose estimates, simplified dose calculations based on operational basis source term data are presented below. These calculations further assume that the annual average dispersion/deposition parameters are used and that 25% of the ground-level release dose is from I-131 ingested by the maximally exposed individual via the goat milk pathway at the controlling location. The simplified dose estimate for exposure to the infant thyroid is:

$$D = 1.83E4\ W\ (\tilde{Q})_{I\text{-}131}\ (4.00)$$

where:

W = 5.7E-10 $(\overline{D/Q})$ for food and ground plane pathway, in m^{-2} corresponding to the controlling location (S @ 5.0 miles). The controlling location is the location in the unrestricted area where the total offsite dose from combined semi-elevated and ground level releases of radioiodines, particulates and other radionuclides is determined to be a maximum. This location <u>is also</u> the controlling location for the ground level release calculations performed separately.

$(\tilde{Q})_{I\text{-}131}$ = the total I-131 activity released from Oconee ground-level release points in μCi.

1.83E4 = (3.17E-08) $(R_i^G[\overline{D/Q}])$ with the appropriate substitutions for the infant-goat milk pathway, $(R_i^C[\overline{D/Q}])$, for $_{I\text{-}131}$. See Section 3.1.2.2.

4.00 = factor derived from the assumption that 25% of the total inhalation, food and ground plane pathway dose to the maximally exposed individual is contributed by I-131 via the goat milk pathway.

4.4 FUEL CYCLE CALCULATIONS

As discussed in Section 3.3.5, more than one nuclear power station site may contribute to the doses to be considered in accordance with 40CFR190. The fuel cycle dose assessments for Oconee Nuclear Station only include liquid and gaseous dose contributions from Oconee Nuclear Station since no other uranium fuel cycle facility contributes significantly to Oconee's maximum exposed individual. For this dose assessment, the total body and maximum organ dose contributions to the maximum exposed individual from Oconee's liquid and gaseous releases are estimated using the following calculations:

$$D_{tb}(T) = D_{tb}(1) + D_{tb}(g_e) + D_{tb}(g_g)$$

$$D_{mo}(T) = D_{mo}(1) + D_{mo}(g_e) + D_{mo}(g_g)$$

Where:

$D_{tb}(T)$ = Total estimated fuel cycle total body dose commitment resulting from the combined liquid and gaseous effluents from Oconee during the calendar year of interest, in mrem.

$D_{tb}(1)$ = Estimated fuel cycle total body dose contribution resulting from Oconee liquid effluents during the calendar year of interest, in mrem.

$D_{tb}(g_e)$ = Estimated fuel cycle total body dose contribution resulting from Oconee gaseous effluents released from semi-elevated release points during the calendar year of interest, in mrem.

$D_{tb}(g_g)$ = Estimated fuel cycle total body dose contribution resulting from Oconee gaseous effluents released from ground level release points during the calendar year of interest, in mrem.

$D_{mo}(T)$ = Total estimated fuel cycle maximum organ dose commitment resulting from the combined liquid and gaseous effluents from Oconee during the calendar year of interest, in mrem.

$D_{mo}(1)$ = Estimated fuel cycle maximum organ dose contribution resulting from Oconee liquid effluents during the calendar year of interest, in mrem.

$D_{mo}(g_e)$= Estimated fuel cycle maximum organ dose contribution resulting from Oconee gaseous effluents released from semi-elevated release points during the calendar year of interest, in mrem.

$D_{mo}(g_g)$= Estimated fuel cycle maximum organ dose contribution resulting from Oconee gaseous effluents released from ground level release points during the calendar year of interest, in mrem.

A4.4.1 LIQUID EFFLUENTS

Liquid pathway dose estimates are calculated using generic methodology or the LADTAP computer program. The values for $D_{tb}(1)$ and $D_{mo}(1)$ liquid pathway dose contributions are calculated based on the methodology, values and assumptions presented in Section A4.2.1.

A4.4.2 GASEOUS EFFLUENTS

Total Body

The methodology for calculating noble gas airborne pathway total body exposures to the maximum individual, $D_{tb}(g_e)$ and $D_{tb}(g_g)$, is derived from Section 3.1.2.1 generic methodology for gamma air and beta air dose calculations as follows:

$$D_{tb} = 3.17E\text{-}8 \; \Sigma_i \; K_i \; [(X/Q)Q_i] \quad \text{mrem/yr}$$

Generic methodology parameters K_i are described and provided in Section 1.2.1. Oconee site specific parameters for semi-elevated and ground level X/Q values are 4.1E-7 and 9.2E-6, respectively, as described in Section A4.2.2.1 for Oconee gamma air and beta air dose calculations.

Maximum Organ

Airborne pathway maximum organ dose estimates are calculated using generic methodology or the GASPAR computer program. The values for $D_{mo}(g_e)$ and $D_{mo}(g_g)$ airborne pathway dose contributions are calculated based on the methodology, presented in Section A4.2.2.2. The maximum organ dose is established by calculating doses to all organs for each potential maximum offsite location identified in Table A4.0-7. Calculations must be performed separately for semi-elevated and ground level gaseous release types and for all potential maximum locations, age groups and organs in order to assure that the maximum location, organ and age group is indeed analyzed and identified. A conservative estimate (i.e., overestimate) of the fuel cycle maximum organ dose is obtained by 1) performing liquid pathway calculations for each age group and organ, 2) performing gaseous pathway calculations for each age group and organ for all potential maximum exposure locations (see Table A4.0-7) 3) adding the exposure values for each airborne release type (i.e., semi-elevated and ground level) to the same organ dose resulting from liquid releases, 4) comparing total organ dose values for each potential limiting gaseous dose location and determining the maximum organ dose values for each age group, and airborne pathway components are added for all organs and determining maximum organ dose values calculated or each potential limiting gaseous dose location age group, and 5) comparing maximum total doses for each organ and age group and determining the maximum (or limiting) organ and age group. A worksheet is presented in Figure A4.0-11.

An alternative method for estimating fuel cycle maximum organ dose involves performing calculations for all offsite locations and comparing the combined liquid, semi-elevated and ground level release dose totals for each location to determine the maximum organ exposure. Table A4.0-8 provides site survey data indicating the applicable food pathways to be considered for each offsite location.

TABLE A4.0-1a

OCONEE NUCLEAR STATION
(1 of 1)

DISPERSION PARAMETER ($\overline{X/Q}$) FOR SEMI-ELEVATED LONG TERM RELEASES > 500 HR/YR OR > 125 HR/QTR

(sec/m^3)

Distance to the control location, in miles

Sector	0-0.5*	0.5-1.0*	1.0-1.5	1.5-2.0	2.0-2.5	2.5-3.0	3.0-3.5	3.5-4.0	4.0-4.5	4.5-5.0
N			6.5E-8	4.8E-8	4.7E-8	4.7E-8	4.7E-8	6.3E-8	5.9E-8	5.6E-8
NNE			1.1E-7	9.3E-8	8.7E-8	8.9E-8	9.2E-8	9.2E-8	7.2E-8	5.9E-8
NE			7.5E-8	7.2E-8	6.8E-8	5.8E-8	6.1E-8	6.4E-8	6.0E-8	5.7E-8
ENE			6.0E-8	6.4E-8	5.9E-8	6.1E-8	5.7E-8	5.7E-8	5.6E-8	5.6E-8
E			4.1E-8	3.7E-8	5.7E-8	4.8E-8	5.2E-8	4.9E-8	4.7E-8	4.5E-8
ESE			3.0E-8	4.0E-8	6.7E-8	5.8E-8	4.3E-8	5.3E-8	4.9E-8	4.7E-8
SE			2.8E-8	2.8E-8	6.0E-8	5.1E-8	4.1E-8	3.7E-8	3.8E-8	3.8E-8
SSE			2.3E-7	2.0E-7	3.2E-7	2.5E-7	3.7E-7	2.9E-7	2.7E-7	2.5E-7
S			2.6E-7	3.0E-7	2.1E-7	2.1E-7	3.6E-7	4.1E-7	3.7E-7	3.6E-7
SSW			3.2E-7	3.1E-7	2.9E-7	2.7E-7	2.0E-7	1.7E-7	1.7E-7	1.7E-7
SW			7.3E-8	7.1E-8	7.1E-8	5.9E-8	3.9E-8	4.4E-8	4.5E-8	4.5E-8
WSW			5.3E-8	5.2E-8	5.3E-8	4.2E-8	4.8E-8	4.3E-8	4.2E-8	4.2E-8
W			2.7E-8	3.2E-8	3.7E-8	3.7E-8	3.9E-8	3.9E-8	3.7E-8	3.6E-8
WNW			2.3E-8	2.5E-8	3.5E-8	3.5E-8	3.3E-8	3.2E-8	3.0E-8	2.9E-8
NW			3.2E-8	3.7E-8	3.1E-8	3.3E-8	3.0E-8	3.1E-8	2.9E-8	2.8E-8
NNW			6.8E-8	7.7E-8	8.3E-8	7.7E-8	7.8E-8	6.5E-8	6.3E-8	6.2E-8

* Inside Exclusion Area Boundary (EAB)

TABLE A4.0-1b

OCONEE NUCLEAR STATION
(1 of 1)

DEPOSITION PARAMETER ($\overline{D/Q}$) FOR SEMI-ELEVATED LONG TERM RELEASES > 500 HR/YR OR > 125 HR/QTR

(m^{-2})

Distance to the control location, in miles

Sector	0-0.5*	0.5-1.0*	1.0-1.5	1.5-2.0	2.0-2.5	2.5-3.0	3.0-3.5	3.5-4.0	4.0-4.5	4.5-5.0
N			2.4E-9	1.4E-9	8.7E-10	6.0E-10	4.7E-10	3.6E-10	2.8E-10	2.3E-10
NNE			4.1E-9	2.2E-9	1.4E-9	9.6E-10	7.4E-10	5.7E-10	4.4E-10	3.6E-10
NE			2.7E-9	1.5E-9	9.7E-10	6.6E-10	5.0E-10	3.9E-10	3.1E-10	2.5E-10
ENE			1.5E-9	8.4E-10	5.4E-10	3.7E-10	2.8E-10	2.2E-10	1.7E-10	1.4E-10
E			1.6E-9	8.7E-10	5.6E-10	3.9E-10	3.0E-10	2.3E-10	1.8E-10	1.5E-10
ESE			1.3E-9	7.0E-10	4.5E-10	3.0E-10	2.3E-10	1.8E-10	1.4E-10	1.1E-10
SE			8.0E-10	4.4E-10	2.9E-10	2.0E-10	1.5E-10	1.2E-10	8.9E-11	7.3E-11
SSE			2.7E-9	1.6E-9	1.1E-9	7.5E-10	6.0E-10	4.6E-10	3.6E-10	3.0E-10
S			4.5E-9	2.6E-9	1.7E-9	1.2E-9	9.0E-10	7.0E-10	5.5E-10	4.5E-10
SSW			4.3E-9	2.5E-9	1.6E-9	1.1E-9	8.5E-10	6.5E-10	5.0E-10	4.2E-10
SW			1.4E-9	8.4E-10	5.5E-10	3.9E-10	3.0E-10	2.3E-10	1.8E-10	1.5E-10
WSW			1.6E-9	9.1E-10	6.0E-10	4.1E-10	3.2E-10	2.5E-10	1.9E-10	1.6E-10
W			1.4E-9	7.9E-10	5.1E-10	3.6E-10	2.7E-10	2.1E-10	1.6E-10	1.3E-10
WNW			7.7E-10	4.4E-10	2.9E-10	2.0E-10	1.5E-10	1.2E-10	9.2E-11	7.4E-11
NW			1.1E-9	5.9E-10	3.8E-10	2.6E-10	2.0E-10	1.6E-10	1.2E-10	9.9E-11
NNW			1.9E-9	1.0E-9	6.6E-10	4.5E-10	3.5E-10	2.7E-10	2.1E-10	1.7E-10

* Inside Exclusion Area Boundary (EAB)

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TABLE A4.0-2b

OCONEE NUCLEAR STATION
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DEPOSITION PARAMETER ($\overline{D/Q}$) FOR GROUND LEVEL, LONG TERM RELEASES > 500 HR/YR OR > 125 HR/QTR

(m^{-2})

Distance to the control location, in miles

Sector	0-0.5*	0.5-1.0*	1.0-1.5	1.5-2.0	2.0-2.5	2.5-3.0	3.0-3.5	3.5-4.0	4.0-4.5	4.5-5.0
N			1.2E-8	4.3E-9	2.1E-9	1.3E-9	8.2E-10	5.8E-10	4.3E-10	3.3E-10
NNE			1.5E-8	5.2E-9	2.6E-9	1.5E-9	1.0E-9	7.0E-10	5.2E-10	4.0E-10
NE			1.7E-8	5.9E-9	2.9E-9	1.7E-9	1.1E-9	8.0E-10	5.9E-10	4.6E-10
ENE			1.1E-8	3.9E-9	1.9E-9	1.1E-9	7.5E-10	5.3E-10	3.9E-10	3.0E-10
E			1.2E-8	4.2E-9	2.1E-9	1.2E-9	8.0E-10	5.6E-10	4.2E-10	3.2E-10
ESE			1.1E-8	3.8E-9	1.9E-9	1.1E-9	7.3E-10	5.1E-10	3.8E-10	2.9E-10
SE			9.5E-9	3.4E-9	1.7E-9	1.0E-9	6.5E-10	4.6E-10	3.4E-10	2.6E-10
SSE			1.2E-8	4.2E-9	2.1E-9	1.2E-9	7.9E-10	5.6E-10	4.1E-10	3.2E-10
S			2.1E-8	7.5E-9	3.7E-9	2.2E-9	1.4E-9	1.0E-9	7.4E-10	5.7E-10
SSW			1.2E-8	4.1E-9	2.1E-9	1.2E-9	7.9E-10	5.6E-10	4.1E-10	3.2E-10
SW			1.6E-8	5.9E-9	2.9E-9	1.7E-9	1.1E-9	8.0E-10	5.9E-10	4.5E-10
WSW			1.3E-8	4.5E-9	2.2E-9	1.3E-9	8.6E-10	6.1E-10	4.5E-10	3.5E-10
W			9.8E-9	3.5E-9	1.8E-9	1.0E-9	6.7E-10	4.7E-10	3.5E-10	2.7E-10
WNW			5.9E-9	2.1E-9	1.1E-9	6.2E-10	4.1E-10	2.9E-10	2.1E-10	1.6E-10
NW			7.3E-9	2.6E-9	1.3E-9	7.7E-10	5.0E-10	3.5E-10	2.6E-10	2.0E-10
NNW			9.7E-9	3.5E-9	1.7E-9	1.0E-9	6.6E-10	4.7E-10	3.5E-10	2.7E-10

* Inside Exclusion Area Boundary (EAB)

TABLE A4.0-2a

OCONEE NUCLEAR STATION
(1 of 1)

DISPERSON PARAMETER ($\overline{X/Q}$) FOR GROUND LEVEL, LONG TERM RELEASES > 500 HR/YR OR > 125 HR/QTR

(sec/m^3)

Distance to the control location, in miles

Sector	0-0.5*	0.5-1.0*	1.0-1.5	1.5-2.0	2.0-2.5	2.5-3.0	3.0-3.5	3.5-4.0	4.0-4.5	4.5-5.0
N			2.7E-6	1.1E-6	6.1E-7	3.9E-7	2.8E-7	2.1E-7	1.6E-7	1.3E-7
NNE			2.4E-6	9.8E-7	5.4E-7	3.4E-7	2.4E-7	1.8E-7	1.4E-7	1.2E-7
NE			2.9E-6	1.2E-6	6.5E-7	4.2E-7	2.9E-7	2.2E-7	1.7E-7	1.4E-7
ENE			2.6E-6	1.0E-6	5.7E-7	3.6E-7	2.6E-7	1.9E-7	1.5E-7	1.2E-7
E			3.0E-6	1.2E-6	6.6E-7	4.3E-7	3.0E-7	2.3E-7	1.8E-7	1.4E-7
ESE			3.1E-6	1.2E-6	6.9E-7	4.5E-7	3.2E-7	2.4E-7	1.9E-7	1.6E-7
SE			3.7E-6	1.5E-6	8.4E-7	5.4E-7	3.9E-7	2.9E-7	2.3E-7	1.9E-7
SSE			5.3E-6	2.2E-6	1.2E-6	7.9E-7	5.7E-7	4.3E-7	3.4E-7	2.8E-7
S			9.2E-6	3.7E-6	2.1E-6	1.4E-6	9.8E-7	7.4E-7	5.9E-7	4.8E-7
SSW			4.4E-6	1.8E-6	1.0E-6	6.5E-7	4.6E-7	3.5E-7	2.8E-7	2.3E-7
SW			4.5E-6	1.8E-6	1.0E-6	6.5E-7	4.6E-7	3.5E-7	2.7E-7	2.2E-7
WSW			2.6E-6	1.1E-6	5.9E-7	3.8E-7	2.7E-7	2.0E-7	1.6E-7	1.3E-7
W			2.2E-6	9.1E-7	5.0E-7	3.2E-7	2.3E-7	1.7E-7	1.3E-7	1.1E-7
WNW			1.6E-6	6.6E-7	3.6E-7	2.3E-7	1.7E-7	1.2E-7	9.8E-8	8.0E-8
NW			1.9E-6	7.7E-7	4.2E-7	2.7E-7	1.9E-7	1.4E-7	1.1E-7	9.1E-8
NNW			2.4E-6	9.9E-7	5.4E-7	3.5E-7	2.5E-7	1.9E-7	1.5E-7	1.2E-7

* Inside Exclusion Area Boundary (EAB)

TABLE A4.0–3

(1 of 2)

LIQUID EFFLUENT DOSE – ADULT PARAMETERS
OCONEE NUCLEAR STATION
$A_{(I)}$ MREM/HR PER UCI/ML

NUCLIDE		BONE	LIVER	T. BODY	THYROID	KIDNEY	LUNG	GI–LLI
H	3	0.00E+00	8.96E+00	8.96E+00	8.96E+00	8.96E+00	8.96E+00	8.96E+00
NA	24	5.48E+02	5.48E+02	5.48E+02	5.48E+02	5.48E+02	5.48E+02	5.48E+02
CR	51	0.00E+00	0.00E+00	1.49E+00	8.94E–01	3.29E–01	1.98E+00	3.76E+02
MN	54	0.00E+00	4.76E+03	9.08E+02	0.00E+00	1.42E+03	0.00E+00	1.46E+04
MN	56	0.00E+00	1.20E+02	2.12E+01	0.00E+00	1.52E+02	0.00E+00	3.82E+03
FE	55	8.87E+02	6.13E+02	1.43E+02	0.00E+00	0.00E+00	3.42E+02	3.52E+02
FE	59	1.40E+03	3.29E+03	1.26E+03	0.00E+00	0.00E+00	9.19E+02	1.10E+04
CO	58	0.00E+00	1.51E+02	3.39E+02	0.00E+00	0.00E+00	0.00E+00	3.06E+03
CO	60	0.00E+00	4.34E+02	9.58E+02	0.00E+00	0.00E+00	0.00E+00	8.16E+03
NI	63	4.19E+04	2.91E+03	1.41E+03	0.00E+00	0.00E+00	0.00E+00	6.07E+02
NI	65	1.70E+02	2.21E+01	1.01E+01	0.00E+00	0.00E+00	0.00E+00	5.61E+02
CU	64	0.00E+00	1.69E+01	7.93E+00	0.00E+00	4.26E+01	0.00E+00	1.44E+03
ZN	65	2.36E+04	7.50E+04	3.39E+04	0.00E+00	5.02E+04	0.00E+00	4.73E+04
BR	83	0.00E+00	0.00E+00	4.38E+01	0.00E+00	0.00E+00	0.00E+00	6.30E+01
BR	85	0.00E+00	0.00E+00	2.33E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RB	86	0.00E+00	1.03E+05	4.79E+04	0.00E+00	0.00E+00	0.00E+00	2.03E+04
RB	88	0.00E+00	2.95E+02	1.56E+02	0.00E+00	0.00E+00	0.00E+00	4.07E–09
RB	89	0.00E+00	1.95E+02	1.37E+02	0.00E+00	0.00E+00	0.00E+00	1.13E–11
SR	89	4.78E+04	0.00E+00	1.37E+03	0.00E+00	0.00E+00	0.00E+00	7.66E+03
SR	90	5.95E+05	0.00E+00	1.60E+05	0.00E+00	0.00E+00	0.00E+00	3.40E+04
SR	91	8.79E+02	0.00E+00	3.55E+01	0.00E+00	0.00E+00	0.00E+00	4.19E+03
SR	92	3.33E+02	0.00E+00	1.44E+01	0.00E+00	0.00E+00	0.00E+00	6.60E+03
Y	90	1.38E+00	0.00E+00	3.69E–02	0.00E+00	0.00E+00	0.00E+00	1.46E+04
Y	91 M	1.30E–02	0.00E+00	5.04E–04	0.00E+00	0.00E+00	0.00E+00	3.82E–02
Y	91	2.02E+01	0.00E+00	5.39E–01	0.00E+00	0.00E+00	0.00E+00	1.11E+04
Y	92	1.21E–01	0.00E+00	3.53E–03	0.00E+00	0.00E+00	0.00E+00	2.12E+03
Y	93	3.83E–01	0.00E+00	1.06E–02	0.00E+00	0.00E+00	0.00E+00	1.22E+04
ZR	95	2.77E+00	8.88E–01	6.01E–01	0.00E+00	1.39E+00	0.00E+00	2.82E+03
ZR	97	1.53E–01	3.09E–02	1.41E–02	0.00E+00	4.67E–02	0.00E+00	9.57E+03
NB	95	4.47E+02	2.49E+02	1.34E+02	0.00E+00	2.46E+02	0.00E+00	1.51E+06
MO	99	0.00E+00	4.62E+02	8.79E+01	0.00E+00	1.05E+03	0.00E+00	1.07E+03
TC	99 M	2.94E–02	8.32E–02	1.06E+00	0.00E+00	1.26E+00	4.07E–02	4.92E+01
TC	101	3.03E–02	4.36E–02	4.28E–01	0.00E+00	7.85E–01	2.23E–02	1.31E–13

TABLE A4.0-3

(2 of 2)

LIQUID EFFLUENT DOSE – ADULT PARAMETERS
OCONEE NUCLEAR STATION
$A_{(I)}$ MREM/HR PER UCI/ML

NUCLIDE		BONE	LIVER	T. BODY	THYROID	KIDNEY	LUNG	GI-LLI
RU	103	1.98E+01	0.00E+00	8.54E+00	0.00E+00	7.57E+01	0.00E+00	2.31E+03
RU	105	1.65E+00	0.00E+00	6.52E-01	0.00E+00	2.13E+01	0.00E+00	1.01E+03
RU	106	2.95E+02	0.00E+00	3.73E+01	0.00E+00	5.69E+02	0.00E+00	1.91E+04
AG	110 M	1.42E+01	1.31E+01	7.80E+00	0.00E+00	2.58E+01	0.00E+00	5.36E+03
TE	125	2.79E+03	1.01E+03	3.74E+02	8.39E+02	1.13E+04	0.00E+00	1.11E+04
TE	127 M	7.05E+03	2.52E+03	8.59E+02	1.80E+03	2.86E+04	0.00E+00	2.36E+04
TE	127	1.14E+02	4.11E+01	2.48E+01	8.48E+01	4.66E+02	0.00E+00	9.03E+03
TE	129 M	1.20E+04	4.47E+03	1.89E+03	4.11E+03	5.00E+04	0.00E+00	6.03E+04
TE	129	3.27E+01	1.23E+01	7.96E+00	2.51E+01	1.37E+02	0.00E+00	2.47E+01
TE	131 M	1.80E+03	8.81E+02	7.34E+02	1.39E+03	8.92E+03	0.00E+00	8.74E+04
TE	131	2.05E+01	8.57E+00	6.47E+00	1.69E+01	8.98E+01	0.00E+00	2.90E+00
TE	132	2.62E+03	1.70E+03	1.59E+03	1.87E+03	1.63E+04	0.00E+00	8.02E+04
I	130	9.01E+01	2.66E+02	1.05E+02	2.25E+04	4.15E+02	0.00E+00	2.29E+02
I	131	4.96E+02	7.09E+02	4.06E+02	2.32E+05	1.22E+03	0.00E+00	1.87E+02
I	132	2.42E+01	6.47E+01	2.26E+01	2.26E+03	1.03E+02	0.00E+00	1.22E+01
I	133	1.69E+02	2.94E+02	8.97E+01	4.32E+04	5.13E+02	0.00E+00	2.64E+02
I	135	5.28E+01	1.38E+02	5.10E+01	9.11E+03	2.22E+02	0.00E+00	1.56E+02
CS	134	3.03E+05	7.21E+05	5.89E+05	0.00E+00	2.33E+05	7.75E+04	1.26E+04
CS	136	3.17E+04	1.25E+05	9.01E+04	0.00E+00	6.97E+04	9.55E+03	1.42E+04
CS	137	3.88E+05	5.31E+05	3.48E+05	0.00E+00	1.80E+05	5.99E+04	1.03E+04
CS	138	2.69E+02	5.31E+02	2.63E+02	0.00E+00	3.90E+02	3.85E+01	2.27E-03
LA	142	1.83E-02	8.33E-03	2.07E-03	0.00E+00	0.00E+00	0.00E+00	6.08E+01
CE	141	8.01E-01	5.42E-01	6.15E-02	0.00E+00	2.52E-01	0.00E+00	2.07E+03
CE	143	1.41E-01	1.04E+02	1.16E-02	0.00E+00	4.60E-02	0.00E+00	3.90E+03
CE	144	4.18E+01	1.75E+01	2.24E+00	0.00E+00	1.04E+01	0.00E+00	1.41E+04
PR	143	1.32E+00	5.28E-01	6.52E-02	0.00E+00	3.05E-01	0.00E+00	5.77E+03
PR	144	4.31E-03	1.79E-03	2.19E-04	0.00E+00	1.01E-03	0.00E+00	6.19E-10
ND	147	9.00E-01	1.04E+00	6.22E-02	0.00E+00	6.08E-01	0.00E+00	4.99E+03
W	187	3.04E+02	2.55E+02	8.90E+01	0.00E+00	0.00E+00	0.00E+00	8.34E+04
NP	239	1.28E-01	1.25E-02	6.91E-03	0.00E+00	3.91E-02	0.00E+00	2.57E+03

TABLE A4.0–4

(1 of 2)

LIQUID EFFLUENT DOSE – TEEN PARAMETERS
OCONEE NUCLEAR STATION
$A_{(I)}$ MREM/HR PER UCI/ML

NUCLIDE		BONE	LIVER	T. BODY	THYROID	KIDNEY	LUNG	GI–LLI
H	3	0.00E+00	6.34E+00	6.34E+00	6.34E+00	6.34E+00	6.34E+00	6.34E+00
NA	24	5.53E+02	5.53E+02	5.53E+02	5.53E+02	5.53E+02	5.53E+02	5.53E+02
CR	51	0.00E+00	0.00E+00	1.52E+00	8.46E–01	3.34E–01	2.17E+00	2.56E+02
MN	54	0.00E+00	4.65E+03	9.22E+02	0.00E+00	1.39E+03	0.00E+00	9.53E+03
MN	56	0.00E+00	1.24E+02	2.21E+01	0.00E+00	1.58E+02	0.00E+00	8.19E+03
FE	55	9.09E+02	6.45E+02	1.50E+02	0.00E+00	0.00E+00	4.09E+02	2.79E+02
FE	59	1.41E+03	3.30E+03	1.27E+03	0.00E+00	0.00E+00	1.04E+03	7.79E+03
CO	58	0.00E+00	1.45E+02	3.35E+02	0.00E+00	0.00E+00	0.00E+00	2.00E+03
CO	60	0.00E+00	4.20E+02	9.45E+02	0.00E+00	0.00E+00	0.00E+00	5.47E+03
NI	63	4.26E+04	3.01E+03	1.44E+03	0.00E+00	0.00E+00	0.00E+00	4.79E+02
NI	65	1.80E+02	2.30E+01	1.05E+01	0.00E+00	0.00E+00	0.00E+00	1.25E+03
CU	64	0.00E+00	1.72E+01	8.08E+00	0.00E+00	4.35E+01	0.00E+00	1.33E+03
ZN	65	2.13E+04	7.41E+04	3.46E+04	0.00E+00	4.74E+04	0.00E+00	3.14E+04
BR	83	0.00E+00	0.00E+00	4.73E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR	85	0.00E+00	0.00E+00	2.51E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RB	86	0.00E+00	1.10E+05	5.19E+04	0.00E+00	0.00E+00	0.00E+00	1.63E+04
RB	88	0.00E+00	3.16E+02	1.68E+02	0.00E+00	0.00E+00	0.00E+00	2.71E–05
RB	89	0.00E+00	2.04E+02	1.44E+02	0.00E+00	0.00E+00	0.00E+00	3.12E–07
SR	89	4.97E+04	0.00E+00	1.42E+03	0.00E+00	0.00E+00	0.00E+00	5.91E+03
SR	90	5.06E+05	0.00E+00	1.35E+05	0.00E+00	0.00E+00	0.00E+00	2.63E+04
SR	91	9.11E+02	0.00E+00	3.62E+01	0.00E+00	0.00E+00	0.00E+00	4.13E+03
SR	92	3.44E+02	0.00E+00	1.47E+01	0.00E+00	0.00E+00	0.00E+00	8.77E+03
Y	90	1.42E+00	0.00E+00	3.83E–02	0.00E+00	0.00E+00	0.00E+00	1.17E+04
Y	91	1.34E–02	0.00E+00	5.11E–04	0.00E+00	0.00E+00	0.00E+00	6.32E–01
Y	91 M	2.09E+01	0.00E+00	5.59E–01	0.00E+00	0.00E+00	0.00E+00	8.55E+03
Y	92	1.26E–01	0.00E+00	3.63E–03	0.00E+00	0.00E+00	0.00E+00	3.44E+03
Y	93	3.97E–01	0.00E+00	1.09E–02	0.00E+00	0.00E+00	0.00E+00	1.21E+04
ZR	95	2.64E+00	8.34E–01	5.74E–01	0.00E+00	1.23E+00	0.00E+00	1.92E+03
ZR	97	1.52E–01	3.01E–02	1.39E–02	0.00E+00	4.56E–02	0.00E+00	8.15E+03
NB	95	4.50E+02	2.50E+02	1.37E+02	0.00E+00	2.42E+02	0.00E+00	1.07E+06
MO	99	0.00E+00	4.61E+02	8.78E+01	0.00E+00	1.05E+03	0.00E+00	8.25E+02
TC	99 M	2.84E–02	7.92E–02	1.03E+00	0.00E+00	1.18E+00	4.39E–02	5.20E+01
TC	101	3.08E–02	4.38E–02	4.30E–01	0.00E+00	7.92E–01	2.67E–02	7.48E–09

TABLE A4.0-4

(2 of 2)

LIQUID EFFLUENT DOSE - TEEN PARAMETERS
OCONEE NUCLEAR STATION
$A_{(\tau)}$ MREM/HR PER UCI/ML

NUCLIDE	BONE	LIVER	T. BODY	THYROID	KIDNEY	LUNG	GI-LLI
RU 103	1.95E+01	0.00E+00	8.33E+00	0.00E+00	6.87E+01	0.00E+00	1.63E+03
RU 105	1.67E+00	0.00E+00	6.46E-01	0.00E+00	2.10E+01	0.00E+00	1.34E+03
RU 106	2.99E+02	0.00E+00	3.77E+01	0.00E+00	5.77E+02	0.00E+00	1.44E+04
AG 110 M	1.28E+01	1.21E+01	7.36E+00	0.00E+00	2.31E+01	0.00E+00	3.40E+03
TE 125 M	3.02E+03	1.09E+03	4.03E+02	8.43E+02	0.00E+00	0.00E+00	8.90E+03
TE 127 M	7.62E+03	2.70E+03	9.06E+02	1.81E+03	3.09E+04	0.00E+00	1.90E+04
TE 127	1.24E+02	4.41E+01	2.68E+01	8.59E+01	5.04E+02	0.00E+00	9.61E+03
TE 129 M	1.28E+04	4.77E+03	2.03E+03	4.14E+03	5.37E+04	0.00E+00	4.82E+04
TE 129	3.53E+01	1.32E+01	8.59E+00	2.52E+01	1.48E+02	0.00E+00	1.93E+02
TE 131 M	1.92E+03	9.22E+02	7.69E+02	1.39E+03	9.61E+03	0.00E+00	7.40E+04
TE 131	2.20E+01	9.06E+00	6.87E+00	1.69E+01	9.61E+01	0.00E+00	1.80E+00
TE 132	2.75E+03	1.74E+03	1.64E+03	1.84E+03	1.67E+04	0.00E+00	5.51E+04
I 130	8.81E+01	2.55E+02	1.02E+02	2.08E+04	3.92E+02	0.00E+00	1.96E+02
I 131	5.00E+02	7.00E+02	3.76E+02	2.04E+05	1.21E+03	0.00E+00	1.39E+02
I 132	2.39E+01	6.24E+01	2.24E+01	2.10E+03	9.83E+01	0.00E+00	2.72E+01
I 133	1.72E+02	2.92E+02	8.89E+01	4.07E+04	5.11E+02	0.00E+00	2.21E+02
I 135	5.22E+01	1.34E+02	4.98E+01	8.64E+03	2.12E+02	0.00E+00	1.49E+02
CS 134	3.10E+05	7.30E+05	3.39E+05	0.00E+00	2.32E+05	8.86E+04	9.08E+03
CS 136	3.18E+04	1.25E+05	8.41E+04	0.00E+00	6.82E+04	1.07E+04	1.01E+04
CS 137	4.15E+05	5.52E+05	1.92E+05	0.00E+00	1.88E+05	7.30E+04	7.86E+03
CS 138	2.88E+02	5.52E+02	2.76E+02	0.00E+00	4.08E+02	4.74E+01	2.51E-01
BA 139	9.10E+00	6.40E-03	2.65E-01	0.00E+00	6.03E-03	4.41E-03	8.11E+01
BA 140	1.86E+03	2.28E+00	1.20E+02	0.00E+00	7.72E-01	1.53E+00	2.87E+03
BA 141	4.39E+00	3.28E-03	1.47E-01	0.00E+00	3.04E-03	2.24E-03	9.36E-06
BA 142	1.96E+00	1.96E-03	1.20E-01	0.00E+00	1.66E-03	1.30E-03	6.01E-12
LA 140	3.61E-01	1.77E-01	4.72E-02	0.00E+00	0.00E+00	0.00E+00	1.02E+04
LA 142	1.86E-02	8.25E-03	2.05E-03	0.00E+00	0.00E+00	0.00E+00	2.51E+02
CE 141	7.98E-01	5.32E-01	6.12E-02	0.00E+00	2.51E-01	0.00E+00	1.52E+03
CE 143	1.41E-01	1.03E+02	1.15E-02	0.00E+00	4.60E-02	0.00E+00	3.08E+03
CE 144	4.17E+01	1.73E+01	2.24E+00	0.00E+00	1.03E+01	0.00E+00	1.05E+04
PR 143	1.36E+00	5.43E-01	6.76E-02	0.00E+00	3.15E-01	0.00E+00	4.47E+03
PR 144	4.46E-03	1.83E-03	2.26E-04	0.00E+00	1.05E-03	0.00E+00	4.92E-06
ND 147	9.73E-01	1.06E+00	6.34E-02	0.00E+00	6.21E-01	0.00E+00	3.82E+03
W 187	3.28E+02	2.67E+02	9.37E+01	0.00E+00	0.00E+00	0.00E+00	7.24E+04
NP 239	1.34E-01	1.27E-02	7.04E-03	0.00E+00	3.98E-02	0.00E+00	2.04E+03

TABLE A4.0–5

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LIQUID EFFLUENT DOSE – CHILD PARAMETERS
OCONEE NUCLEAR STATION
$A_{(\Pi)}$ MREM/HR PER UCI/ML

NUCLIDE		BONE	LIVER	T. BODY	THYROID	KIDNEY	LUNG	GI–LLI
H	3	0.00E+00	1.19E+01	1.19E+01	1.19E+01	1.19E+01	1.19E+01	1.19E+01
NA	24	7.93E+02	7.93E+02	7.93E+02	7.93E+02	7.93E+02	7.93E+02	7.93E+02
CR	51	0.00E+00	0.00E+00	1.92E+00	1.06E+00	2.91E–01	1.94E+00	1.02E+02
MN	54	0.00E+00	3.99E+03	1.06E+03	0.00E+00	1.12E+03	0.00E+00	3.35E+03
MN	56	0.00E+00	1.25E+02	2.81E+01	0.00E+00	1.51E+02	0.00E+00	1.80E+04
FE	55	1.57E+03	8.34E+02	2.59E+02	0.00E+00	0.00E+00	4.72E+02	1.55E+02
FE	59	2.26E+03	3.65E+03	1.82E+03	0.00E+00	0.00E+00	1.06E+03	3.80E+03
CO	58	0.00E+00	1.75E+02	5.37E+02	0.00E+00	0.00E+00	0.00E+00	1.02E+03
CO	60	0.00E+00	5.16E+02	1.52E+03	0.00E+00	0.00E+00	0.00E+00	2.86E+03
NI	63	7.36E+04	3.94E+03	2.50E+03	0.00E+00	0.00E+00	0.00E+00	2.65E+02
NI	65	3.04E+02	2.86E+01	1.67E+01	0.00E+00	0.00E+00	0.00E+00	3.50E+03
CU	64	0.00E+00	2.39E+01	1.44E+01	0.00E+00	5.77E+01	0.00E+00	1.12E+03
ZN	65	2.23E+04	5.95E+04	3.70E+04	0.00E+00	3.75E+04	0.00E+00	1.05E+04
BR	83	0.00E+00	0.00E+00	6.64E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR	85	0.00E+00	0.00E+00	3.54E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RB	86	0.00E+00	1.09E+05	6.72E+04	0.00E+00	0.00E+00	0.00E+00	7.03E+03
RB	88	0.00E+00	3.10E+02	2.15E+02	0.00E+00	0.00E+00	0.00E+00	1.52E+01
RB	89	0.00E+00	1.91E+02	1.70E+02	0.00E+00	0.00E+00	0.00E+00	1.66E+00
SR	89	1.08E+05	0.00E+00	3.08E+03	0.00E+00	0.00E+00	0.00E+00	4.18E+03
SR	90	9.24E+05	0.00E+00	2.48E+05	0.00E+00	0.00E+00	0.00E+00	1.87E+04
SR	91	1.96E+03	0.00E+00	7.41E+01	0.00E+00	0.00E+00	0.00E+00	4.33E+03
SR	92	7.38E+02	0.00E+00	2.96E+01	0.00E+00	0.00E+00	0.00E+00	1.40E+04
Y	90	3.20E+00	0.00E+00	8.56E–02	0.00E+00	0.00E+00	0.00E+00	9.10E+03
Y	91 M	2.97E–02	0.00E+00	1.08E–03	0.00E+00	0.00E+00	0.00E+00	5.82E+01
Y	91	4.68E+01	0.00E+00	1.25E+00	0.00E+00	0.00E+00	0.00E+00	6.24E+03
Y	92	2.80E–01	0.00E+00	8.01E–03	0.00E+00	0.00E+00	0.00E+00	8.09E+03
Y	93	8.87E–01	0.00E+00	2.44E–02	0.00E+00	0.00E+00	0.00E+00	1.32E+04
ZR	95	7.05E+00	1.55E+00	1.38E+00	0.00E+00	2.22E+00	0.00E+00	1.62E+03
ZR	97	4.25E–01	6.13E–02	3.62E–02	0.00E+00	8.81E–02	0.00E+00	9.29E+03
NB	95	5.32E+02	2.07E+02	1.48E+02	0.00E+00	1.95E+02	0.00E+00	3.83E+05
MO	99	0.00E+00	8.78E+02	2.17E+02	0.00E+00	1.87E+03	0.00E+00	7.26E+02
TC	99 M	6.46E–02	1.27E–01	2.10E+00	0.00E+00	1.84E+00	6.43E–02	7.20E+01

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LIQUID EFFLUENT DOSE - CHILD PARAMETERS
OCONEE NUCLEAR STATION
$A_{(I)}$ MREM/HR PER UCI/ML

NUCLIDE	BONE	LIVER	T. BODY	THYROID	KIDNEY	LUNG	GI-LLI
TC 101	7.48E-02	7.83E-02	9.93E-01	0.00E+00	1.34E+00	4.14E-02	2.49E-01
RU 103	4.83E+01	0.00E+00	1.85E+01	0.00E+00	1.21E+02	0.00E+00	1.25E+03
RU 105	4.26E+00	0.00E+00	1.54E+00	0.00E+00	3.74E+01	0.00E+00	2.78E+03
RU 106	7.72E+02	0.00E+00	9.64E+01	0.00E+00	1.04E+03	0.00E+00	1.20E+04
AG 110 M	3.23E+01	2.18E+01	1.74E+01	0.00E+00	4.06E+01	0.00E+00	2.60E+03
TE 125 M	4.25E+03	1.15E+03	5.67E+02	1.19E+03	0.00E+00	0.00E+00	4.10E+03
TE 127 M	1.08E+04	2.90E+03	1.28E+03	2.58E+03	3.07E+04	0.00E+00	8.72E+03
TE 127	1.76E+02	4.73E+01	3.77E+01	1.22E+02	5.00E+02	0.00E+00	6.86E+03
TE 129 M	1.82E+04	5.07E+03	2.82E+03	5.85E+03	5.33E+04	0.00E+00	2.21E+04
TE 129	5.00E+01	1.39E+01	1.19E+01	3.56E+01	1.46E+02	0.00E+00	3.11E+03
TE 131 M	2.68E+03	9.28E+02	9.88E+02	1.91E+03	8.98E+03	0.00E+00	3.77E+04
TE 131	3.09E+01	9.43E+00	9.21E+00	2.37E+01	9.36E+01	0.00E+00	1.63E+02
TE 132	3.77E+03	1.67E+03	2.01E+03	2.43E+03	1.55E+04	0.00E+00	1.68E+04
I 130	2.04E+02	4.13E+02	2.13E+02	4.55E+04	6.17E+02	0.00E+00	1.93E+02
I 131	1.20E+03	1.21E+03	6.87E+02	4.00E+05	1.99E+03	0.00E+00	1.08E+02
I 132	5.60E+01	1.03E+02	4.73E+01	4.77E+03	1.57E+02	0.00E+00	1.21E+02
I 133	4.14E+02	5.12E+02	1.94E+02	9.51E+04	8.53E+02	0.00E+00	2.06E+02
I 135	1.22E+02	2.20E+02	1.04E+02	1.95E+04	3.38E+02	0.00E+00	1.68E+02
CS 134	3.82E+05	6.26E+05	1.32E+05	0.00E+00	1.94E+05	6.97E+04	3.38E+03
CS 136	3.83E+04	1.05E+05	6.82E+04	0.00E+00	5.61E+04	8.37E+03	3.70E+03
CS 137	5.33E+05	5.11E+05	7.54E+04	0.00E+00	1.66E+05	5.99E+04	3.20E+03
CS 138	3.72E+02	5.17E+02	3.28E+02	0.00E+00	3.64E+02	3.92E+01	2.38E+02
BA 139	2.54E+01	1.35E-02	7.35E-01	0.00E+00	1.18E-02	7.97E-03	1.46E+03
BA 140	5.09E+03	4.46E+00	2.97E+02	0.00E+00	1.45E+00	2.66E+00	2.58E+03
BA 141	1.23E+01	6.86E-03	3.99E-01	0.00E+00	5.94E-03	4.03E-02	6.99E+00
BA 142	5.36E+00	3.85E-03	2.99E-01	0.00E+00	3.12E-03	2.27E-03	6.99E-02
LA 140	7.86E-01	2.75E-01	9.26E-02	0.00E+00	0.00E+00	0.00E+00	7.66E+03
LA 142	4.08E-02	1.30E-02	4.07E-03	0.00E+00	0.00E+00	0.00E+00	2.58E+03
CE 141	2.34E+00	1.17E+00	1.73E-01	0.00E+00	5.11E-01	0.00E+00	1.46E+03
CE 143	4.12E-01	2.23E+02	3.24E-02	0.00E+00	9.37E-02	0.00E+00	3.27E+03
CE 144	1.23E+02	3.84E+01	6.54E+00	0.00E+00	2.13E+01	0.00E+00	1.00E+04
PR 143	3.06E+00	9.18E-01	1.52E-01	0.00E+00	4.97E-01	0.00E+00	3.30E+03
PR 144	1.00E-02	3.10E-03	5.05E-04	0.00E+00	1.64E-03	0.00E+00	6.68E+00
ND 147	2.17E+00	1.76E+00	1.36E-01	0.00E+00	9.65E-01	0.00E+00	2.79E+03
W 187	4.30E+02	2.55E+02	1.14E+02	0.00E+00	0.00E+00	0.00E+00	3.58E+04
NP 239	3.47E-01	2.49E-02	1.75E-02	0.00E+00	7.19E-02	0.00E+00	1.84E+03

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LIQUID EFFLUENT DOSE – INFANT PARAMETERS
OCONEE NUCLEAR STATION
$A_{(\Pi)}$ MREM/HR PER UCI/ML

NUCLIDE		BONE	LIVER	T. BODY	THYROID	KIDNEY	LUNG	GI-LLI
H	3	0.00E+00	1.16E+01	1.16E+01	1.16E+01	1.16E+01	1.16E+01	1.16E+01
NA	24	3.80E+02	3.80E+02	3.80E+02	3.80E+02	3.80E+02	3.80E+02	3.80E+02
CR	51	0.00E+00	0.00E+00	5.30E-01	3.46E-01	7.56E-02	6.73E-01	1.55E+01
MN	54	0.00E+00	7.49E+02	1.70E+02	0.00E+00	1.66E+02	0.00E+00	2.75E+02
MN	56	0.00E+00	3.08E+01	5.30E+00	0.00E+00	2.64E+01	0.00E+00	2.80E+03
FE	55	5.23E+02	3.38E+02	9.03E+01	0.00E+00	0.00E+00	1.65E+02	4.29E+01
FE	59	1.16E+03	2.02E+03	7.98E+02	0.00E+00	0.00E+00	5.98E+02	9.67E+02
CO	58	0.00E+00	1.35E+02	3.38E+02	0.00E+00	0.00E+00	0.00E+00	3.37E+02
CO	60	0.00E+00	4.06E+02	9.59E+02	0.00E+00	0.00E+00	0.00E+00	9.67E+02
NI	63	2.39E+04	1.47E+03	8.28E+02	0.00E+00	0.00E+00	0.00E+00	7.34E+01
NI	65	1.77E+02	2.00E+01	9.10E+00	0.00E+00	0.00E+00	0.00E+00	1.52E+03
CU	64	0.00E+00	2.29E+01	1.06E+01	0.00E+00	3.87E+01	0.00E+00	4.70E+02
ZN	65	6.92E+02	2.37E+03	1.09E+03	0.00E+00	1.15E+03	0.00E+00	2.01E+03
BR	83	0.00E+00	0.00E+00	1.37E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR	85	0.00E+00	0.00E+00	7.30E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RB	86	0.00E+00	6.40E+03	3.16E+03	0.00E+00	0.00E+00	0.00E+00	1.64E+02
RB	88	0.00E+00	1.87E+01	1.03E+01	0.00E+00	0.00E+00	0.00E+00	1.82E+01
RB	89	0.00E+00	1.08E+01	7.41E+00	0.00E+00	0.00E+00	0.00E+00	3.66E+00
SR	89	9.44E+04	0.00E+00	2.71E+03	0.00E+00	0.00E+00	0.00E+00	1.94E+03
SR	90	4.70E+05	0.00E+00	1.27E+05	0.00E+00	0.00E+00	0.00E+00	8.69E+03
SR	91	1.88E+03	0.00E+00	6.81E+01	0.00E+00	0.00E+00	0.00E+00	2.23E+03
SR	92	7.22E+02	0.00E+00	2.68E+01	0.00E+00	0.00E+00	0.00E+00	7.79E+03
Y	90	3.27E+00	0.00E+00	8.77E-02	0.00E+00	0.00E+00	0.00E+00	4.51E+03
Y	91 M	3.05E-02	0.00E+00	1.04E-03	0.00E+00	0.00E+00	0.00E+00	1.02E+02
Y	91	4.25E+01	0.00E+00	1.13E+00	0.00E+00	0.00E+00	0.00E+00	3.05E+03
Y	92	2.88E-01	0.00E+00	8.09E-03	0.00E+00	0.00E+00	0.00E+00	5.49E+03
Y	93	9.14E-01	0.00E+00	2.49E-02	0.00E+00	0.00E+00	0.00E+00	7.22E+03
ZR	95	7.75E+00	1.89E+00	1.34E+00	0.00E+00	2.04E+00	0.00E+00	9.41E+02
ZR	97	5.57E-01	9.56E-02	4.36E-02	0.00E+00	9.63E-02	0.00E+00	6.09E+03
NB	95	1.58E+00	6.51E-01	3.76E-01	0.00E+00	4.66E-01	0.00E+00	5.49E+02
MO	99	0.00E+00	1.28E+03	2.49E+02	0.00E+00	1.91E+03	0.00E+00	4.21E+02
TC	99 M	7.22E-02	1.49E-01	1.92E+00	0.00E+00	1.60E+00	7.79E-02	4.33E+01
TC	101	8.54E-02	1.08E-01	1.06E+00	0.00E+00	1.28E+00	5.87E-02	1.83E+01

TABLE A4.0-6

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LIQUID EFFLUENT DOSE – INFANT PARAMETERS
OCONEE NUCLEAR STATION
$A_{(\Pi)}$ MREM/HR PER UCI/ML

NUCLIDE		BONE	LIVER	T. BODY	THYROID	KIDNEY	LUNG	GI-LLI
RU	103	5.57E+01	0.00E+00	1.86E+01	0.00E+00	1.16E+02	0.00E+00	6.77E+02
RU	105	5.12E+00	0.00E+00	1.72E+00	0.00E+00	3.76E+01	0.00E+00	2.04E+03
RU	106	9.07E+02	0.00E+00	1.13E+02	0.00E+00	1.07E+03	0.00E+00	6.88E+03
AG	110 M	3.75E+01	2.73E+01	1.81E+01	0.00E+00	3.91E+01	0.00E+00	1.42E+03
TE	125 M	8.77E+02	2.93E+02	1.19E+02	2.95E+02	0.00E+00	0.00E+00	4.18E+02
TE	127 M	2.20E+03	7.30E+02	2.66E+02	6.36E+02	5.42E+03	0.00E+00	8.88E+02
TE	127	3.76E+01	1.26E+01	8.09E+00	3.06E+01	9.18E+01	0.00E+00	7.90E+02
TE	129 M	3.76E+03	1.29E+03	5.79E+02	1.44E+03	9.41E+03	0.00E+00	2.25E+03
TE	129	1.07E+01	3.68E+00	2.49E+00	8.95E+00	2.66E+01	0.00E+00	8.54E+02
TE	131 M	5.72E+02	2.30E+02	1.90E+02	4.66E+02	1.58E+03	0.00E+00	3.87E+03
TE	131	6.62E+00	2.45E+00	1.86E+00	5.91E+00	1.69E+01	0.00E+00	2.67E+02
TE	132	7.82E+02	3.87E+02	3.62E+02	5.72E+02	2.42E+03	0.00E+00	1.43E+03
I	130	2.26E+02	4.97E+02	1.99E+02	5.57E+04	5.45E+02	0.00E+00	1.06E+02
I	131	1.35E+03	1.59E+03	7.00E+02	5.23E+05	1.86E+03	0.00E+00	5.68E+01
I	132	6.24E+01	1.27E+02	4.51E+01	5.94E+03	1.41E+02	0.00E+00	1.03E+02
I	133	4.70E+02	6.85E+02	2.01E+02	1.25E+05	8.05E+02	0.00E+00	1.16E+02
I	135	1.37E+02	2.72E+02	9.93E+01	2.44E+04	3.04E+02	0.00E+00	9.86E+01
CS	134	1.42E+04	2.64E+04	2.67E+03	0.00E+00	6.81E+03	2.79E+03	7.19E+01
CS	136	1.73E+03	5.08E+03	1.90E+03	0.00E+00	2.02E+03	4.14E+02	7.71E+01
CS	137	1.96E+04	2.30E+04	1.63E+03	0.00E+00	6.17E+03	2.50E+03	7.19E+01
CS	138	1.81E+01	2.94E+01	1.43E+01	0.00E+00	1.47E+01	2.29E+00	4.70E+01
BA	139	3.31E+01	2.20E-02	9.59E-01	0.00E+00	1.32E-02	1.33E-02	2.10E+03
BA	140	6.43E+03	6.43E+00	3.31E+02	0.00E+00	1.53E+00	3.95E+00	1.58E+03
BA	141	1.60E+01	1.09E-02	5.04E-01	0.00E+00	6.58E-03	6.66E-03	1.95E+02
BA	142	6.92E+00	5.76E-03	3.41E-01	0.00E+00	3.31E-03	3.48E-03	2.86E+01
LA	140	7.94E-01	3.13E-01	8.05E-02	0.00E+00	0.00E+00	0.00E+00	3.68E+03
LA	142	4.14E-02	1.52E-02	3.64E-03	0.00E+00	0.00E+00	0.00E+00	2.58E+03
CE	141	2.96E+00	1.81E+00	2.13E-01	0.00E+00	5.57E-01	0.00E+00	9.33E+02
CE	143	5.57E-01	3.69E+02	4.21E-02	0.00E+00	1.08E-01	0.00E+00	2.16E+03
CE	144	1.12E+02	4.59E+01	6.28E+00	0.00E+00	1.85E+01	0.00E+00	6.43E+03
PR	143	3.06E+00	1.14E+00	1.52E-01	0.00E+00	4.25E-01	0.00E+00	1.61E+03
PR	144	1.03E-02	3.99E-03	5.19E-04	0.00E+00	1.44E-03	0.00E+00	1.85E+02
ND	147	2.08E+00	2.14E+00	1.31E-01	0.00E+00	8.24E-01	0.00E+00	1.35E+03
W	187	3.40E+01	2.36E+01	8.16E+00	0.00E+00	0.00E+00	0.00E+00	1.39E+03
NP	239	4.18E-01	3.74E-02	2.11E-02	0.00E+00	7.45E-02	0.00E+00	1.08E+03

Table A4.0-7 - Meteorological Parameter and Applicable Pathways Potential Worst-case Offsite Locations for Analyzing Offsite Doses from Particulate, Iodine and Other Radionuclides

Semi-elevated Release Worst-case Location

	(X/Q)	(D/Q)	Applicable Pathways
1) Inhalation, 3.5 mi, S	4.1E-07	7.0E-10	Grnd, Inh, Veg*
2) Garden, 1.0 mi, S	2.4E-07	4.5E-09	Grnd, Inh, Veg
3) Meat Animal, 2.0 mi,WSW	5.3E-08	6.0E-10	Grnd, Inh,Veg, Meat
4) Milk Animal, 4.0 mi,WNW	3.0E-08	9.2E-11	(Enveloped by Location 5)
5) Combination, >5.0 mi,S	3.6E-07	4.5E-10	Grnd, Inh, Veg, Meat, Goat Milk

Ground Level Release Worst-case Locations

	(X/Q)	(D/Q)	Applicable Pathways
1) Inhalation, 1.0 mi,S	9.2E-06	2.1E-08	Grnd, Inh, Veg*
2) Garden, 1.0 mi,S	9.2E-06	2.1E-08	Grnd, Inh, Veg
3) Meat Animal, 2.0 mi,WSW	5.9E-07	2.2E-09	Grnd, Inh, Veg, Meat
4) Milk Animal, 4.0 mi,WNW	9.8E-08	2.1E-10	(Enveloped by Location 5)
5) Combination, >5.0 mi,S	4.8E-07	5.7E-10	Grnd, Inh, Veg, Meat, Goat Milk

* Gardens are assumed to exist at all offsite locations since offsite survey does not include data for vegetable gardens.

FIGURE A4.0-1

OCONEE LADTAP INPUT TEMPLATE
FOR LIQUID RADIONUCLIDE RELEASE OFFSITE DOSE CALCULATIONS

```
****** ****************************** TOP OF DATA ********************************
=COLS> ----+----1----+----2----+----3----+----4----+----5----+----6----+----7--
000001   LADTAP INPUT FOR OCONEE ODCM METHOD - DEFAULT DILUTION
000002          0   6.4E+02       1.0          1
000003        1.0
000004   LIQUID RELEASE SOURCE TERMS - CURIES PER RELEASE PERIOD
000005   H 3       0.00E+00
000006   NA24      0.00E+00
000007   CR51      0.00E+00
000008   MN54      0.00E+00
000009   MN56      0.00E+00
000010   FE55      0.00E+00
000011   FE59      0.00E+00
000012   CO58      0.00E+00
000013   CO60      0.00E+00
000014   NI63      0.00E+00
000015   NI65      0.00E+00
000016   CU64      0.00E+00
000017   ZN65      0.00E+00
000018   CN69      0.00E+00
000019   BR83      0.00E+00
000020   BR85      0.00E+00
000021   RB86      0.00E+00
000022   RB88      0.00E+00
000023   RB89      0.00E+00
000024   SR89      0.00E+00
000025   SR90      0.00E+00
000026   SR91      0.00E+00
000027   SR92      0.00E+00
000028   Y 90      0.00E+00
000029   Y 91 M    0.00E+00
000030   Y 91      0.00E+00
000031   Y 92      0.00E+00
000032   Y 93      0.00E+00
000033   ZR95      0.00E+00
000034   ZR97      0.00E+00
000035   NB95      0.00E+00
000036   MO99      0.00E+00
000037   TC99 M    0.00E+00
000038   TC101     0.00E+00
000039   RU103     0.00E+00
000040   RU105     0.00E+00
000041   RU106     0.00E+00
000042   AG110M    0.00E+00
000043   TE125M    0.00E+00
000044   TE127M    0.00E+00
000045   TE127     0.00E+00
000046   TE129M    0.00E+00
000047   TE129     0.00E+00
000048   TE131M    0.00E+00
000049   TE131     0.00E+00
000050   TE132     0.00E+00
000051   I 130     0.00E+00
000052   I 131     0.00E+00
000053   I 132     0.00E+00
000054   I 133     0.00E+00
000055   I 135     0.00E+00
000056   CS134     0.00E+00
000057   CS136     0.00E+00
000058   CS137     0.00E+00
000059   CS138     0.00E+00
000060   BA139     0.00E+00
000061   BA140     0.00E+00
000062   BA141     0.00E+00
000063   BA142     0.00E+00
```

FIGURE A4.0-1 (Cont'd)

OCONEE LADTAP INPUT TEMPLATE
FOR LIQUID RADIONUCLIDE RELEASE OFFSITE DOSE CALCULATIONS

```
=COLS> ----+----1----+----2----+----3----+----4----+----5----+----6----+----7--
000064   LA140     0.00E+00
000065   LA142     0.00E+00
000066   CE141     0.00E+00
000067   CE143     0.00E+00
000068   CE144     0.00E+00
000069   PR143     0.00E+00
000070   PR144     0.00E+00
000071   ND147     0.00E+00
000072   W 187     0.00E+00
000073   NP239     0.00E+00
000074
000075
000076                0.2       1.0       1.0       1.0       0.0       0.0
000077
000078
000079
****** ***************************** BOTTOM OF DATA ******************************
```

FIGURE A4.0-2

OCONEE GASPAR INPUT TEMPLATE
FOR NOBLE GAS RADIONUCLIDE RELEASE WORST-CASE LOCATIONS

```
****** ******************************** TOP OF DATA ********************************
=COLS> ----+----1----+----2----+----3----+----4----+----5----+----6----+----7--
000001 GASPAR INPUT FOR OCONEE ODCM METHOD - MAX NOBLE GAS DOSE CALCULATIONS
000002  0         0.0       0.0       0.0       0.0
000003  1 1
000004      1.0     1.0     1.0    0.76     1.0
000005 SEMI-ELEVATED NOBLE GAS RELEASE SOURCE TERM - CURIES PER RELEASE PERIOD
000006         1.0
000007   AR41       0.00E+00
000008   KR83 M     0.00E+00
000009   KR85       0.00E+00
000010   KR85 M     0.00E+00
000011   KR87       0.00E+00
000012   KR88       0.00E+00
000013   KR89       0.00E+00
000014   XE131M     0.00E+00
000015   XE133      0.00E+00
000016   XE133M     0.00E+00
000017   XE135      0.00E+00
000018   XE135M     0.00E+00
000019   XE137      0.00E+00
000020   XE138      0.00E+00
000021
000022   SEMI-ELEV MAX       S 3.50     4.1E-07   4.1E-07   4.1E-07   7.0E-10
000023
000024 GROUND LEVEL NOBLE GAS RELEASE SOURCE TERM - CURIES PER RELEASE PERIOD
000025         1.0
000026   AR41       0.00E+00
000027   KR83 M     0.00E+00
000028   KR85       0.00E+00
000029   KR85 M     0.00E+00
000030   KR87       0.00E+00
000031   KR88       0.00E+00
000032   KR89       0.00E+00
000033   XE131M     0.00E+00
000034   XE133      0.00E+00
000035   XE133M     0.00E+00
000036   XE135      0.00E+00
000037   XE135M     0.00E+00
000038   XE137      0.00E+00
000039   XE138      0.00E+00
000040
000041   GROUND MAX          S 1.00     9.2E-06   9.2E-06   9.2E-06   2.1E-08
****** ******************************** BOTTOM OF DATA ********************************
```

FIGURE A4.0-3

OCONEE GASPAR INPUT TEMPLATE
FOR PARTICULATE, IODINE AND OTHER RADIONUCLIDE RELEASE WORST-CASE LOCATIONS

```
****** ****************************** TOP OF DATA ********************************
=COLS> ----+----1----+----2----+----3----+----4----+----5----+----6----+----7--
000001 GASPAR INPUT FOR OCONEE CDCM METHOD - PART, I, AND OTHER - INHALATION
000002  0         1.0       0.0       0.0       0.0
000003  1 1
000004       1.0     1.0     1.0    0.76     1.0
000005 ELEV RELEASE PART, I AND OTHER SOURCE - CURIES PER RELEASE PERIOD
000006         1.0
000007    H 3       0.00E+00
000008    CR51      0.00E+00
000009    MN54      0.00E+00
000010    FE55      0.00E+00
000011    FE59      0.00E+00
000012    CO58      0.00E+00
000013    CO60      0.00E+00
000014    ZN65      0.00E+00
000015    SR89      0.00E+00
000016    SR90      0.00E+00
000017    ZR95      0.00E+00
000018    MO99      0.00E+00
000019    I 131     0.00E+00
000020    I 133     0.00E+00
000021    CS134     0.00E+00
000022    CS136     0.00E+00
000023    CS137     0.00E+00
000024    BA140     0.00E+00
000025    CE141     0.00E+00
000026    CE144     0.00E+00
000027
000028    LOCATION 1        S   3.50     4.1E-07   4.1E-07   4.1E-07   7.0E-10
000029
000030 GROUND RELEASE PART, I AND OTHER SOURCE - CURIES PER RELEASE PERIOD
000031         1.0
000032    H 3       0.00E+00
000033    CR51      0.00E+00
000034    MN54      0.00E+00
000035    FE55      0.00E+00
000036    FE59      0.00E+00
000037    CO58      0.00E+00
000038    CO60      0.00E+00
000039    ZN65      0.00E+00
000040    SR89      0.00E+00
000041    SR90      0.00E+00
000042    ZR95      0.00E+00
000043    MO99      0.00E+00
000044    I 131     0.00E+00
000045    I 133     0.00E+00
000046    CS134     0.00E+00
000047    CS136     0.00E+00
000048    CS137     0.00E+00
000049    BA140     0.00E+00
000050    CE141     0.00E+00
000051    CE144     0.00E+00
000052
000053    LOCATION 1          S 1.00     9.2E-06   9.2E-06   9.2E-06   2.1E-08
000054
000055
000056
******* ***************************** BOTTOM OF DATA ******************************
```

FIGURE A4.0-3 (Cont'd)

OCONEE GASPAR INPUT TEMPLATE
FOR PARTICULATE, IODINE AND OTHER RADIONUCLIDE RELEASE WORST-CASE LOCATIONS

FOR OTHER LOCATIONS, REPLACE FOLLOWING INPUT LINES:

LOCATION 2 - WORST VEGETABLE GARDEN

```
000001 GASPAR INPUT FOR OCONEE ODCM METHOD - PART, I, AND OTHER - GARDEN
000002  0         1.0       0.0       0.0       0.0
000028   LOCATION 2       S   1.00     2.4E-07   2.4E-07   2.4E-07   4.5E-09
000053   LOCATION 2       S   1.00     9.2E-06   9.2E-06   9.2E-06   2.1E-08
```

LOCATION 3 - WORST MEAT ANIMAL

```
000001 GASPAR INPUT FOR OCONEE ODCM METHOD - PART, I, AND OTHER - MEAT
000002  0         1.0       1.0       0.0       0.0
000028   LOCATION 3       WSW 2.00     5.3E-08   5.3E-08   5.3E-08   6.0E-10
000053   LOCATION 3       WSW 2.00     5.9E-07   5.9E-07   5.9E-07   2.2E-09
```

LOCATION 4 - WORST MILK ANIMAL

(ENVELOPED BY LOCATION 5)

LOCATION 5 - WORST COMBINATION

```
000001 GASPAR INPUT FOR OCONEE ODCM METHOD - PART, I, AND OTHER - COMBINATION
000002  0         1.0       1.0       0.0       1.0
000028   LOCATION 5       S   5.00     3.6E-07   3.6E-07   3.6E-07   4.5E-10
000053   LOCATION 5       S   5.00     4.8E-07   4.8E-07   4.8E-07   4.8E-07
```

Figure A4.0-4 - Fuel Cycle Dose Calculation Worksheet For Organ Doses

Adult Age Group

Liquid Pathway Organ Doses $D_{a,o}(l_o)$

Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI

Airborne Pathway Organ Doses $D_{a,o}(g_e)$ and $D_{a,o}(g_g)$ - Particulate, Iodine and Other Radionuclides with T 1/2 > 8 Days

Location 1 - Worst-case Inhalation Location [1]

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
S-Elev							
Ground							
Total*							

Location 2 - Worst-Case Vegetable Garden Location [2]

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
S-Elev							
Ground							
Total*							

Location 3 - Worst-case Meat Animal Location [3]

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
S-Elev							
Ground							
Total*							

Locations 4 and 5 - Worst-case Milk/Combination Location [4]

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
S-Elev							
Ground							
Total*							

Adult Organ Maximums**

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
Total							

Figure A4.0-4 (Cont'd) - Fuel Cycle Dose Calculation Worksheet For Organ Doses

Teen Age Group

Liquid Pathway Organ Doses $D_{a,o}(1_o)$

Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI

Airborne Pathway Organ Doses $D_{a,o}(g_e)$ and $D_{a,o}(g_g)$ - Particulate, Iodine and Other Radionuclides with T 1/2 > 8 Days

Location 1 - Worst-case Inhalation Location [1]

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
S-Elev							
Ground							
Total*							

Location 2 - Worst-Case Vegetable Garden Location [2]

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
S-Elev							
Ground							
Total*							

Location 3 - Worst-case Meat Animal Location [3]

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
S-Elev							
Ground							
Total*							

Locations 4 and 5 - Worst-case Milk/Combination Location [4]

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
S-Elev							
Ground							
Total*							

Teen Organ Maximums**

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
Total							

Figure A4.0-4 (Cont'd) - Fuel Cycle Dose Calculation Worksheet For Organ Doses

Child Age Group

Liquid Pathway Organ Doses $D_{a,o}(l_o)$

Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI

Airborne Pathway Organ Doses $D_{a,o}(g_e)$ and $D_{a,o}(g_g)$ - Particulate, Iodine and Other Radionuclides with T 1/2 > 8 Days

Location 1 - Worst-case Inhalation Location [1]

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
S-Elev							
Ground							
Total*							

Location 2 - Worst-Case Vegetable Garden Location [2]

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
S-Elev							
Ground							
Total*							

Location 3 - Worst-case Meat Animal Location [3]

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
S-Elev							
Ground							
Total*							

Locations 4 and 5 - Worst-case Milk/Combination Location [4]

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
S-Elev							
Ground							
Total*							

Child Organ Maximums**

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
Total							

Figure A4.0-4 (Cont'd) - Fuel Cycle Dose Calculation Worksheet For Organ Doses

Infant Age Group

Liquid Pathway Organ Doses $D_{a,o}(l_o)$

Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI

Airborne Pathway Organ Doses $D_{a,o}(g_e)$ and $D_{a,o}(g_g)$ - Particulate, Iodine and Other Radionuclides with T 1/2 > 8 Days

Location 1 - Worst-case Inhalation Location [1]

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
S-Elev							
Ground							
Total*							

Location 2 - Worst-Case Vegetable Garden Location [2]

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
S-Elev							
Ground							
Total*							

Location 3 - Worst-case Meat Animal Location [3]

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
S-Elev							
Ground							
Total*							

Locations 4 and 5 - Worst-case Milk/Combination Location [4]

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
S-Elev							
Ground							
Total*							

Infant Organ Maximums**

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
Total							

Figure A4.0-4 - Fuel Cycle Dose Calculation Worksheet For Organ Doses

Adult Age Group

Liquid Pathway Organ Doses $D_{a,o}(l_o)$

Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI

Airborne Pathway Organ Doses $D_{a,o}(g_e)$ and $D_{a,o}(g_g)$ - Particulate, Iodine and Other Radionuclides with T 1/2 > 8 Days

Location 1 - Worst-case Inhalation Location [1]

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
S-Elev							
Ground							
Total*							

Location 2 - Worst-Case Vegetable Garden Location [2]

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
S-Elev							
Ground							
Total*							

Location 3 - Worst-case Meat Animal Location [3]

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
S-Elev							
Ground							
Total*							

Locations 4 and 5 - Worst-case Milk/Combination Location [4]

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
S-Elev							
Ground							
Total*							

Adult Organ Maximums**

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
Total							

Figure A4.0-4 (Cont'd) - Fuel Cycle Dose Calculation Worksheet For Organ Doses

Teen Age Group

Liquid Pathway Organ Doses $D_{a,o}(1_o)$

Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI

Airborne Pathway Organ Doses $D_{a,o}(g_e)$ and $D_{a,o}(g_g)$ - Particulate, Iodine and Other Radionuclides with T 1/2 > 8 Days

Location 1 - Worst-case Inhalation Location [1]

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
S-Elev							
Ground							
Total*							

Location 2 - Worst-Case Vegetable Garden Location [2]

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
S-Elev							
Ground							
Total*							

Location 3 - Worst-case Meat Animal Location [3]

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
S-Elev							
Ground							
Total*							

Locations 4 and 5 - Worst-case Milk/Combination Location [4]

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
S-Elev							
Ground							
Total*							

Teen Organ Maximums**

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
Total							

Figure A4.0-4 (Cont'd) - Fuel Cycle Dose Calculation Worksheet For Organ Doses

Child Age Group

Liquid Pathway Organ Doses $D_{a,o}(1_o)$

Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI

Airborne Pathway Organ Doses $D_{a,o}(g_e)$ and $D_{a,o}(g_g)$ - Particulate, Iodine and Other Radionuclides with T 1/2 > 8 Days

Location 1 - Worst-case Inhalation Location [1]

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
S-Elev							
Ground							
Total*							

Location 2 - Worst-Case Vegetable Garden Location [2]

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
S-Elev							
Ground							
Total*							

Location 3 - Worst-case Meat Animal Location [3]

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
S-Elev							
Ground							
Total*							

Locations 4 and 5 - Worst-case Milk/Combination Location [4]

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
S-Elev							
Ground							
Total*							

Child Organ Maximums**

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
Total							

Figure A4.0-4 (Cont'd) - Fuel Cycle Dose Calculation Worksheet For Organ Doses

Infant Age Group

Liquid Pathway Organ Doses $D_{a,o}(l_o)$

Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI

Airborne Pathway Organ Doses $D_{a,o}(g_e)$ and $D_{a,o}(g_g)$ - Particulate, Iodine and Other Radionuclides with T 1/2 > 8 Days

Location 1 - Worst-case Inhalation Location [1]

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
S-Elev							
Ground							
Total*							

Location 2 - Worst-Case Vegetable Garden Location [2]

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
S-Elev							
Ground							
Total*							

Location 3 - Worst-case Meat Animal Location [3]

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
S-Elev							
Ground							
Total*							

Locations 4 and 5 - Worst-case Milk/Combination Location [4]

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
S-Elev							
Ground							
Total*							

Infant Organ Maximums**

	Bone	Liver	T.Body	Thyroid	Kidney	Lung	GI-LLI
Total							

Figure A4.0-4 (Cont.d) - Fuel Cycle Dose Calculation Worksheet for Organ Doses

All Age Groups

Maximum Organ Dose ***

Organ = _____
Age Group = _____
Dose = _____ mrem/yr

Meterological Parameters Used to Evaluated Airborne Pathway Doses:

[1] Semi-elevatee evaluation location is 3.5 mi, S ($\overline{X/Q}$=4.1E-7,$\overline{D/Q}$=7.0E-10);
Ground Level evaluated location is 1.0 mi, S ($\overline{X,Q}$=9.2E-6, $\overline{D/Q}$=2.1E-8).
Applicable pathways: Ground, Vegetable, and Inhalation.

[2] Semi-elevated evaluation location is 1.0 mi, S ($\overline{X/Q}$=2.4E-7, $\overline{D/Q}$=4.5E-9);
Ground Level evaluated location is 1.0 mi, S ($\overline{X/Q}$=9.2E-6, $\overline{D/Q}$=2.1E-8).
Applicable pathways: Ground, Vegetable, and Inhalation.

[2] Semi-evaluated location is 2.0 mi, WSW ($\overline{X/Q}$=5.3E-8, $\overline{D/Q}$=6.0E-10);
Ground Level evaluated location is 2.0 mi, WSW ($\overline{X/Q}$=5.9E-7, $\overline{D/Q}$=2.2E-9).
Applicable pathways: Ground, Vegetable, Meat, and Inhalation.

[3] Semi-elevated evaluated location is > 5.0 mi, S ($\overline{X/Q}$=3.6E-7,$\overline{D/Q}$=4.5E-10);
Ground Level evaluated location is > 5.0 mi, S ($\overline{X/Q}$=4.8E-7,$\overline{D/Q}$=5.7E-10).
Applicable patheays: Ground, Vegetable, Meat, Milk, and Inhalation.
(also Worst-case combination location for all pathways)

Notes:

* Fuel cycle dose for age group a and organ o at analyzed limiting food pathway locations ($D_{a,o}(l_o) + D_{a,o}(g_e) + D_{a,o}(g_g)$).

** Limiting dose estimates for each organ for age group a (maximums of "Total*" values calculated for Locations 1 through 5).

*** Limiting dose estimate for any organ or age group (maximum of "Total" value calculated for any age group)

A5.0 RADIOLOGICAL ENVIRONMENTAL MONITORING

The radiological environmental monitoring program shall be conducted in accordance with Selected Licensee Commitment 16.11-6.

The monitoring program locations and analyses are given in Tables A5.0-1 through A5.0-3 and Figure A5.0-1.

Site specific characteristics make ground water sampling and food product sampling unnecessary. Ground water recharge is from precipitation and the ground water gradient is toward the effluent discharge area; therefore, contamination of ground water from liquid effluents is highly improbable. However, some ground water sampling is performed to verify this. Food products will not be sampled since lake water irrigation of crops is not practiced in the vicinity.

The laboratory performing the radiological environmental analyses shall participate in an interlaboratory comparison program which has been approved by the NRC. This program is the Environmental Protection Agency's (EPA's) Environmental Radioactivity Laboratory Intercomparison Studies (Crosscheck) Program, our participation code is CP.

The dates of the land-use census that was used to identify the controlling receptor locations was 08/07/91 - 08/13/91.

The 1991 land use census did not identify any locations where environmental monitoring samples are required but were not available for collection.

TABLE A5.0-1
(1 of 1)

OCONEE RADIOLOGICAL MONITORING PROGRAM SAMPLING LOCATIONS

(TLD LOCATIONS)

SAMPLING LOCATION	DESCRIPTION *		SAMPLING LOCATION	DESCRIPTION *	
020	SITE BOUNDARY	(0.2 MILES N)	040	4-5 MILE RADIUS	(4.5 MILES E)
021	SITE BOUNDARY	(0.2 MILES NNE)	041	4-5 MILE RADIUS	(4.0 MILES ESE)
022	SITE BOUNDARY	(0.5 MILES NE)	042	4-5 MILE RADIUS	(5.0 MILES SE)
023	SITE BOUNDARY	(0.9 MILES ENE)	043	4-5 MILE RADIUS	(4.0 MILES SSE)
024	SITE BOUNDARY	(0.8 MILES E)	044	4-5 MILE RADIUS	(4.0 MILES S)
025	SITE BOUNDARY	(0.6 MILES ESE)	045	4-5 MILE RADIUS	(5.0 MILES SSW)
026	SITE BOUNDARY	(0.3 MILES SE)	046	4-5 MILE RADIUS	(4.5 MILES SW)
027	SITE BOUNDARY	(0.3 MILES SSE)	047	4-5 MILE RADIUS	(4.0 MILES WSW)
028	SITE BOUNDARY	(0.5 MILES S)	048	4-5 MILE RADIUS	(4.0 MILES W)
029	SITE BOUNDARY	(0.6 MILES SSW)	049	4-5 MILE RADIUS	(4.0 MILES WNW)
030	SITE BOUNDARY	(0.4 MILES SW)	050	4-5 MILE RADIUS	(4.0 MILES NW)
031	SITE BOUNDARY	(0.2 MILES WSW)	051	4-5 MILE RADIUS	(4.5 MILES NNW)
032	SITE BOUNDARY	(0.2 MILES W)	052	SPECIAL INTEREST	(12.0 MILES ENE)
033	SITE BOUNDARY	(0.2 MILES WNW)	053	SPECIAL INTEREST	(11.0 MILES E)
034	SITE BOUNDARY	(0.2 MILES NW)	054	SPECIAL INTEREST	(9.5 MILES ESE)
035	SITE BOUNDARY	(0.1 MILES NNW)	055	SPECIAL INTEREST	(9.5 MILES SSE)
036	4-5 MILE RADIUS	(4.0 MILES N)	056	SPECIAL INTEREST	(8.4 MILES SSW)
037	4-5 MILE RADIUS	(4.5 MILES NNE)	057	SPECIAL INTEREST	(9.0 MILES SW)
038	4-5 MILE RADIUS	(4.0 MILES NE)	058	SPECIAL INTEREST	(10.0 MILES WSW)
039	4-5 MILE RADIUS	(4.0 MILES ENE)	059	SPECIAL INTEREST	(9.0 MILES NW)

* All sampling locations are collected quarterly

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TABLE 3.0-2
(Sheet 1)

OCONEE RADIOLOGICAL MONITORING PROGRAM SAMPLING LOCATIONS
(OTHER SAMPLING LOCATIONS)

CODE:

W - Weekly (≤ 7 days)
SM - Semimonthly (≤ 15 days)
M - Monthly (≤ 31 days)
SA - Semiannually (≤ 184 days)

	SAMPLING LOCATION DESCRIPTION	Air Radioiodines and Particulates	Surface Water	Drinking Water	Shoreline Sediment	Milk	Fish	Broadleaf Vegetation
028	Site Boundary (0.5 miles S)							M
060	New Greenville Water Intake Rd. (2.5 miles NNE) *	W		M			SA	M
061	Old Hwy. 183 (1.5 miles SSW)	W						
062	Lake Keowee/Hydro Intake (0.7 mile ENE) (CONTROL)		M					
063	Lake Hartwell - Hwy 183 Bridge (0.8 mile ESE) (000.7)		M		SA		SA	
064	Seneca (6.7 miles SW) (004.1) (CONTROL)			M				
065	Clemson (8.1 miles SSE) (006.1) DELETED			M				
066	Anderson (19.0 miles SSE) (012) (CONTROL FOR MILK ONLY)			M		SM		
067	Lawrence Ramsey Bridge, Hwy 27 (4.2 miles SSE) (005.2)				SA		SA	
068	High Falls County Park (2.0 miles W) (CONTROL)				SA			
069	Orr's Dairy (4.5 miles WNW) (002.1)					SM		
071	Clemson Dairy (10.3 miles SSE) (006.3)					SM		
072	Hwy 130 (1.7 miles S)	W						
073	Tamassee Dar School (9.0 miles NW) (CONTROL)	W						M
074	Keowee Key Resort (1.7 miles NNW)	W						
075	Willimon Residence (6.0 miles NE) DELETED					SM		

* Control for Fish only

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TABLE A5.0-3
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OCONEE RADIOLOGICAL MONITORING PROGRAM ANALYSES

SAMPLE MEDIUM	ANALYSIS SCHEDULE	ANALYSES				
		GAMMA ISOTOPIC	TRITIUM	LOW LEVEL I-131	GROSS BETA	TLD
1. Air Radioiodine and Particulates	Weekly	X				
2. Direct Radiation	Quarterly					X
3. Surface Water	Monthly	X				
	Quarterly Composite		X			
4. Drinking Water	Monthly	X			X	
	Quarterly Composite		X			
5. Shoreline Sediment	Semiannually	X				
6. Milk	Semimonthly		X		X	
7. Fish	Semiannually	X				
8. Broadleaf Vegetation	Monthly		X			

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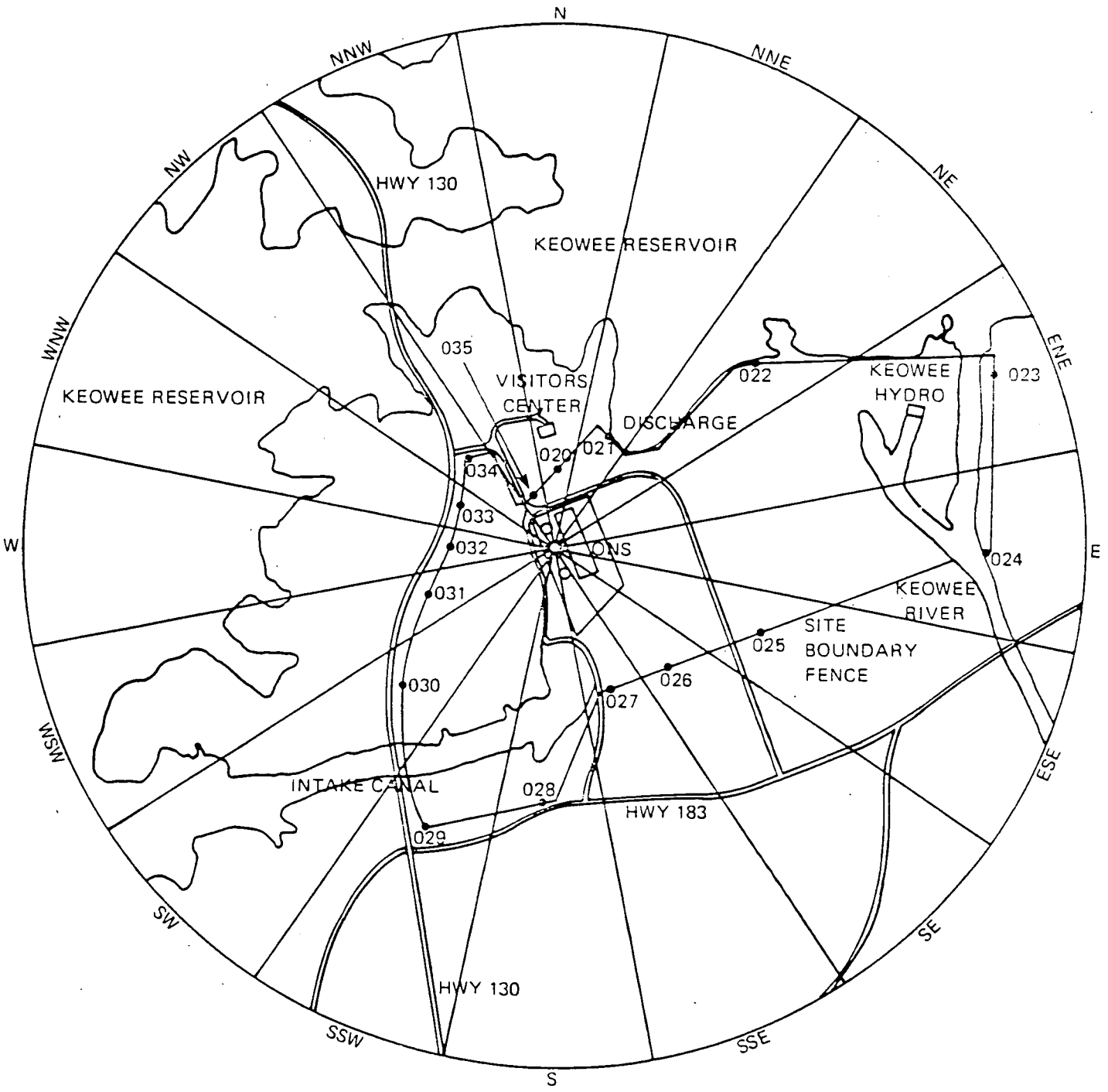

• TLD LOCATIONS

RADIOLOGICAL MONITORING
PROGRAM LOCATIONS
OCONEE NUCLEAR STATION
FIGURE A5.0-1
(2 OF 2)