ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN 651650

Proj. ECN N/A

2. ECN Category (mark one)	3. Originator's Name, Organization, MSIN, and Telephone No.	4. USQ Required?	5. Date
Supplemental [ ] Direct Revision [X] Change ECN [ ] Temporary [ ] Standby [ ] Supersedure [ ] Cancel/Void [ ]	MF Hackworth, WMH, 373-3861	[X] Yes [ ] No WRP-99-021	02/08/99
	6. Project Title/No./Work Order No. N/A	7. Bldg./Sys./Fac. No. 2336-W	8. Approval Designator SQ
	9. Document Numbers Changed by this ECN (includes sheet no. and rev.) HNF-SD-W026-TA-002, Rev. 1, All	10. Related ECN No(s). N/A	11. Related PO No. N/A

12a. Modification Work	12b. Work Package No.	12c. Modification Work Complete	12d. Restored to Original Condition (Temp. or Standby ECN only)
[ ] Yes (fill out Blk. 12b) [X] No (NA Blks. 12b, 12c, 12d)	N/A	N/A Design Authority/Cog. Engineer Signature & Date	N/A Design Authority/Cog. Engineer Signature & Date

13a. Description of Change

13b. Design Baseline Document? [ ] Yes [X] No

This document is being revised in it's entirety and complies with Project Hanford Policies and Procedure HNF-PRO-331, Work Place Air Monitoring

14a. Justification (mark one)

Criteria Change	[X]	Design Improvement	[ ]	Environmental	[ ]	Facility Deactivation	[ ]
As-Found	[ ]	Facilitate Const	[ ]	Const. Error/Omission	[ ]	Design Error/Omission	[ ]

14b. Justification Details

The annual review of this document warrants a full revision.

15. Distribution (include name, MSIN, and no. of copies)

See attached distribution sheet.

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1. ECN (use no. from pg. 1) ECN-651650

16. Design Verification Required	17. Cost Impact N/A		18. Schedule Impact (days) N/A
[ ] Yes	ENGINEERING	CONSTRUCTION	
[X] No	Additional [] $	Additional [] $	Improvement []
	Savings [] $	Savings [] $	Delay []

19. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 13. Enter the affected document number in Block 20.

SDD/DD	[]	Seismic/Stress Analysis	[]	Tank Calibration Manual	[]
Functional Design Criteria	[]	Stress/Design Report	[]	Health Physics Procedure	[]
Operating Specification	[]	Interface Control Drawing	[]	Spares Multiple Unit Listing	[]
Criticality Specification	[]	Calibration Procedure	[]	Test Procedures/Specification	[]
Conceptual Design Report	[]	Installation Procedure	[]	Component Index	[]
Equipment Spec.	[]	Maintenance Procedure	[]	ASME Coded Item	[]
Const. Spec.	[]	Engineering Procedure	[]	Human Factor Consideration	[]
Procurement Spec.	[]	Operating Instruction	[]	Computer Software	[]
Vendor Information	[]	Operating Procedure	[]	Electric Circuit Schedule	[]
OM Manual	[]	Operational Safety Requirement	[]	ICRS Procedure	[]
FSAR/SAR	[]	IEFD Drawing	[]	Process Control Manual/Plan	[]
Safety Equipment List	[]	Cell Arrangement Drawing	[]	Process Flow Chart	[]
Radiation Work Permit	[]	Essential Material Specification	[]	Purchase Requisition	[]
Environmental Impact Statement	[]	Fac. Proc. Samp. Schedule	[]	Tickler File	[]
Environmental Report	[]	Inspection Plan	[]	None	[X]
Environmental Permit	[]	Inventory Adjustment Request	[]		[]

20. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number Revision
NONE		

21. Approvals

	Signature	Date		Signature	Date
Design Authority	N/A		Design Agent		
Cog. Eng.	MF Hackworth	2-10-99	PE		
Cog. Mgr.	JR Weidert	2-17-99	QA		
QA	WR Thackaberry	2.23.99	Safety		
Safety	JC Givens	2-16-99	Design		
Environ.			Environ.		
Other	DN Stewart Per telecon	2/25/99	Other		
Nuclear Safety	RJ Kolt	2-26-99			

DEPARTMENT OF ENERGY

Signature or a Control Number that tracks the Approval Signature

ADDITIONAL

TECHNICAL ASSESSMENT OF COMPLIANCE WITH WORKPLACE AIR SAMPLING REQUIREMENTS AT WRAP

MF Hackworth
Waste Management Federal Services of Hanford, Inc, Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-96RL13200

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Key Words: WRAP, Workplace air monitoring, WAM, HSRCM-1

Abstract: Technical assessment of compliance with workplace air sampling requirements at the Waste Receiving and Processing (WRAP) Facility, annual update.

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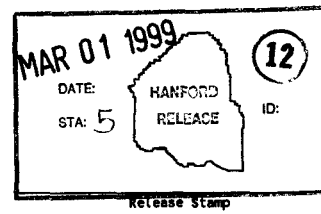

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RECORD OF REVISION	(1) Document Number HNF-SD-W026-TA-002	Page 1

(2) Title
Technical Assessment of Compliance with Workplce Air Sampling Requirements at WRAP

CHANGE CONTROL RECORD

(3) Revision	(4) Description of Change - Replace, Add, and Delete Pages	Authorized for Release	
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SUPPORTING DOCUMENT

TECHNICAL ASSESSMENT OF COMPLIANCE WITH WORKPLACE AIR SAMPLING REQUIREMENTS AT THE WASTE RECEIVING AND PROCESSING FACILITY (WRAP)

Waste Management Federal Services of Hanford, Inc.

Michael F. Hackworth

CONTENTS

1.0 PURPOSE

The purpose of this Technical Assessment is to satisfy HSRCM-1, "Hanford Site Radiological Control Manual" Article 551.4 for a documented study of facility Workplace Air Monitoring (WAM) programs. HSRCM-1 is the primary guidance for radiological control at Waste Management Federal Services of Hanford, Inc. (WMH). The HSRCM-1 complies with Title 10, Part 835 of the Code of Federal Regulations (10CFR835). This document provides an evaluation of the compliance of the Waste Receiving and Processing facility (WRAP) WAM program to the criteria, standards, requirements, and documents compliance with the requirements where appropriate. Where necessary, it also indicates changes needed to bring specific locations into compliance.

2.0 SCOPE

The criteria, standards, and requirements contained in this document apply only to airborne particulate sampling in the workplace. While many of the same requirements apply to air sampling and monitoring for facility effluent streams and for the environmental ambient air sampling program, this document excludes them. The compliance appraisal in this document assumes the placement of fixed WAM equipment in facility areas that are normally or continuously occupied as part of facility operations, and such sampling systems are strongly recommended for this purpose. Air sampling for non-routine or infrequent activities are conducted as described in HNF-PRO-666, *Grab Air Sampling*. If potential airborne contamination is suspected, a Radiological Work Permit (RWP) will be included in the work package to specify the air sampling requirements for personnel protection. Conclusions concerning compliance to requirements and changes necessary for compliance apply only to WRAP.

3.0 CRITERIA, STANDARDS, AND REQUIREMENTS

The Department of Energy, through 10CFR835, requires its contractors to conduct air monitoring to detect and evaluate airborne radioactive material in the workplace. A compilation of the criteria and standards applicable to WAM programs is contained in HNF-PRO-331, *Work Place Air Monitoring*. A description of the criteria as follows:

10 CFR 835

Paragraph 835.403 (a)(1)

Air sampling shall be performed in occupied areas where, under typical conditions, an individual is likely to receive an annual intake of 2 percent or more of the specified ALI values. For a given radionuclide, and lung retention class, the ALI is the product of the DAC listed in appendix A of this part, and the constant 2.4 x 10^9 ml...

Paragraph 835.403 (a)(2)

Real-time air monitoring, using continuous air monitors ...shall be performed in normally occupied areas where an individual is likely to be exposed to a concentration of airborne radioactivity exceeding 1 DAC as specified in appendix A of this part or where there is a need to alert potentially exposed individuals to unexpected increases in airborne radioactivity levels.

Paragraph 835.403 (a)(3)

For the airborne radioactive material that could be encountered, real-time air monitors shall have alarm capability and sufficient sensitivity to alert potentially exposed individuals that immediate action is necessary in order to minimize or terminate inhalation exposures.

Paragraph 835.403 (b)

Monitoring of radiation in the workplace shall be performed using stationary (area) or portable radiation instruments, or a combination thereof..."

HSRCM-1

Article 551.4

The Radiological Control Organization shall perform and document a review of the adequacy of sampling and monitoring systems as part of any facility or operational changes affecting radiological control. In the absence of such changes, a review should be conducted annually.

HSRCM-1

Article 555.1

In addition to the requirements of Article 551, air monitoring equipment should be used in situations where airborne radioactivity levels can fluctuate and early detection of airborne radioactivity could prevent or minimize inhalation of radioactivity by personnel. Selection of air monitoring equipment should be based on the specific job being monitored. Air monitoring equipment includes portable and fixed air sampling equipment and continuous air monitors.

Article 555.2

Air sampling equipment shall be used in occupied areas where, under normal operating conditions, a person is likely to receive an annual intake of 2 percent or more of the specified Annual Limit of Intake (ALI) values...

Article 555.3

Continuous air monitoring equipment shall be installed in occupied areas where a person without respiratory protection is likely to be exposed to a concentration of radioactivity in air exceeding 1 DAC, or where there is a need to alert potentially exposed workers to unexpected increases in the airborne radioactivity levels. A person exposed continuously to a concentration of radioactivity in air of 1 DAC for 1 work week would generally receive a committed effective dose equivalent of approximately 100 mrem.

Article 555.4

Air sampling equipment should be positioned to measure air concentration to which persons are exposed. If this cannot be achieved, a program of personal breathing-zone air sampling should be initiated.

HSRCM-1

Article 555.5

Air monitoring equipment shall be routinely calibrated and maintained at a frequency of at least once per year. Continuous air monitors should be capable of measuring 1 DAC when averaged over 8 hours (8 DAC-hours) under laboratory conditions.

Article 555.6

Continuous air monitoring equipment required by Article 555.3 shall have alarm capability and sufficient sensitivity to alert personnel that immediate action is necessary in order to minimize or terminate inhalation exposures.

4.0 TECHNICAL BASIS FOR REQUIRING WORKPLACE AIR MONITORING

4.1 BASIS FOR REQUIRING A WAM SYSTEM

There are three basis for requiring a WAM system in a room or building. First, there must be a potential to exceed 2% of any Annual Limit of Intake (ALI). Second, if the 2% ALI is exceeded, it must be breathed by a person who is there as part of a normal/routine work assignment. Third, the potential to exceed 2% of any ALI must be from a single failure or abnormal event to result in worker exposure. All three basis must be present for a WAM system to be required.

There must be a potential for a worker to be exposed to one Derived Air Concentration (DAC) in a room/building over a prolonged period of time for continuous air monitoring, i.e., installation of a continuous air monitor (CAM), to be required.

4.1.1 Potential to Exceed 2% of ALI

The potential to exceed 2% of any ALI is evaluated by reviewing historical and current airborne radioactivity data and by calculating potential airborne radioactivity concentrations based on source terms available and possible single failure events. The potential for a worker to exceed 2% of ALI is also dependent on the amount of time spent in the room or building and is the limiting factor at occupancies greater than 96 minutes per day (90 minutes for simplicity). For 90 minutes or less occupancy, the potential for 2% of ALI will not be reached before 10% DAC, at which time air sampling will be performed and respiratory

protection would be used in most cases. Source terms include radioactive materials being used or transported in the building or room and surface contamination levels present in equipment (e.g., gloveboxes) and on floors. If airborne radioactivity data or calculations indicate 2% of any ALI has been or could be exceeded, the first basis for requiring a sampling program pertains to the building or room in question.

4.1.2 Personnel Present

If the building or room is occupied or traversed by personnel as part of their normal/routine job, the second basis is met. "Occupied" is defined as 96 minutes (90 for simplicity), or greater, per day from Attachment 1 of Radiation Protection Technical Basis TBTN#CDGH-9608-MCC-0079, *CDMP Work Place Air Monitoring Standards*. Any area with an occupancy rate greater than 96 min/day (8 h/wk, 104 h/qtr, 416 h/yr, etc.) but less than 2000 h/yr is infrequently occupied. 2000 h/yr represents continuous occupancy.

4.1.3 Single Failure or Abnormal Event

Historical data and industry data such as component failure rate information are used to evaluate the possibility that a single failure could result in airborne radioactivity concentrations that could cause an individual to exceed 2% ALI. The potential for an abnormal event is determined through review of existing safety analysis documents and, where necessary, by room or building-specific safety evaluation.

4.2 BASIS FOR DECLARING WAM NOT REQUIRED

If any of the three basis for requiring a sampling system is not present, then a sampling system is not required.

4.2.1 No Potential to Exceed 2% of ALI

If there is no potential to exceed 2% of ALI, a sampler is not required. Reasons why no potential exists include no radioactive material present, radioactive material is in a form that will not produce any or sufficient airborne contamination to exceed 2% of any ALI.

For surface contamination, the concentration present must be less than that required to produce 2% of a DAC (which would result in 2% ALI if an exposure is for an entire working year of 2000 hours). Using the 1E-06/m resuspension

factor (a different value may be used for specific nuclides and material forms when empirical data is available) the surface contamination required to achieve 2% of DAC in a room is 880 dpm/100 cm^2 alpha (based on Pu-239) and 8.8 x 10^5 dpm/100 cm^2 beta-gamma (based on Sr-90). These values assume the required surface contamination is present over the entire horizontal surface area of the room.

4.2.2 Personnel not Routinely Present

If personnel are not routinely present (not more than 90 minutes per day), a sampling system is not required. Areas entered only to take periodic (not more often than daily) samples or periodically record instrument readings are generally considered to not require WAM systems. [NOTE: For respiratory protection purposes, monitoring of any job where the potential exists to exceed 10% of DAC, using instrumentation specified by Radiological Control, is required regardless of the time the job takes.]

4.2.3 No Single Failure or Event

A WAM system is not required in any room or building where two or more engineered barriers exist between the potential source and the individual. The two barriers can be structural and/or physical and must prevent release of material to the breathing zone of the worker. Examples of barriers include gloveboxes, directed air flow, closed source material containers, etc.

5.0 BACKGROUND

5.1 GENERAL

The effort to bring workplace air monitoring programs into compliance with applicable changes in the requirements began with; FDH, Radiation Protection Technical Basis TBTN#PBGH-9608-MCC-0062, *PIC Work Place Air Monitoring* and FDH, Radiation Protection Technical Basis TBTN#CDGH-9608-MCC-0079, *CDMP Work Place Air Monitoring Standards*. Further, HNF-PRO-331 *Work Place Air Monitoring* was established in September 1997 to give the process for establishing facility workplace air monitoring programs that comply with the requirements of 10 CFR 835, G-10 CFR 835/E2, DOE/EH-0256T, and HSRCM-1. This document assesses workplace air monitoring with the requirements in that publication.

5.2 WRAP

WRAP is located at the northwest quadrant of the 200 West area. It receives Low Level and Transuranic Waste for isotopic certification and processing.

6.0 WRAP WORKPLACE AIR MONITORING PROGRAM

6.1 GENERAL

The WRAP facility provides isotopic certification and processing of Low Level Waste (LLW) and Transuranic Waste (TRU) in both drum and box formats. Isotopic certification is performed on newly generated TRU and suspect TRU for the Hanford Site. LLW & TRU in drums is processed through gloveboxes as part of verification efforts or to remove prohibited items from that waste stream.

6.1.1 BUILDING 2336-W

Building 2336-W consists of three principal areas of operation. These areas are: Shipping/Receiving Area Rm 101, Non-Destruction Examination/Non-Destructive Assay (NDE/NDA) Area Rm 104, and the Process Area Rm 107. The shipping/receiving area is where waste containers are received/shipped and includes the TRUPACT loading area. The NDE/NDA area houses the examination and assay systems for waste drums and boxes. The process area contains gloveboxes for processing drummed LLW or TRU. See page 24 for the 2336-W facility layout.

6.1.2 BUILDING 2740-W

Building 2740-W is the administrative support building for WRAP. This building contains most of the offices for the personnel of WRAP. See page 23 for the WRAP complex layout.

6.1.2 BUILDING 2620-W

Building 2620-W is the maintenance support building for WRAP. This building contains the shops for maintenance personnel. See page 23 for the WRAP complex layout.

6.2 WORKPLACE AIR MONITORING PROGRAM

Currently, the WRAP workplace air monitoring program consists of fixed-head samplers and continuous air monitors in rooms with significant quantities of radioactive materials. The samples are collected and analyzed on a weekly basis for gross alpha and gross beta activity. The locations of the samplers are shown in Table 1. Air sample results from March 3, 1997 (prior to phase 1 startup of WRAP) to present time are available from the radiological control organization.

Table 1: Location of WRAP Air Samplers

EDP Code	Location	Type of Sampler	Component Number
W-151	Shipping/Receiving	Beta CAM	12-RITA-515
W-152	Shipping/Receiving	Alpha CAM	12-RITA-511
W-153	NDE/NDA	Beta CAM	12-RITA-514
W-154	NDE/NDA	Alpha CAM	12-RITA-510
W-155	Process Area South	Beta CAM	12-RITA-544
W-156	Process Area South	Alpha CAM	12-RITA-509
W-157	Process Area North	Beta CAM	12-RITA-513
W-158	Process Area North	Alpha CAM	12-RITA-545
W-159	Process HVAC	Beta CAM	12-RITA-516
W-160	Process HVAC	Alpha CAM	12-RITA-512
W-165	LLW RWM Operator Air Sampler	Fixed Head	12-RE-538A
W-166	LLW RWM Operator Air Sampler	Fixed Head	12-RE-538B
W-167	TRU RWM Operator Air Sampler	Fixed Head	12-RE-539A
W-168	TRU RWM Operator Air Sampler	Fixed Head	12-RE-539B
W-169	LLW Line Operator Air Sampler	Fixed Head	12-RE-540A
W-170	LLW Line Operator Air Sampler	Fixed Head	12-RE-540B
W-171	LLW Line Operator Air Sampler	Fixed Head	12-RE-540C
W-172	LLW Line Operator Air Sampler	Fixed Head	12-RE-540D
W-173	TRU Line Operator Air Sampler	Fixed Head	12-RE-541A
W-174	TRU Line Operator Air Sampler	Fixed Head	12-RE-541B
W-175	TRU Line Operator Air Sampler	Fixed Head	12-RE-541C
W-176	TRU Line Operator Air Sampler	Fixed Head	12-RE-541D
W-177	TRU Line Operator Air Sampler	Fixed Head	12-RE-541E
W-178	TRU Line Operator Air Sampler	Fixed Head	12-RE-541F
W-179	302 Glovebox Operating Side	Alpha CAM	12-RITA-590
W-180	308 Glovebox Operating Side	Alpha CAM	12-RITA-591
W-181	302 Glovebox Maintainence Side	Alpha CAM	12-RITA-592
W-182	102 Glovebox Maintainence Side	Beta CAM	12-RITA-593

W-183	102 Glovebox Operating Side	Beta CAM	12-RITA-594
W-184	201 Glovebox	Beta CAM	12-RITA-595
W-185	401 Glovebox	Alpha CAM	12-RITA-596

A review of baseline air sample data collected for the past two years demonstrated that routine operations may generate airborne radioactivity in excess of the trigger level. It must be noted that as WRAP continues to ramp-up to full production, air sample concentrations may vary due to increased operational activities in the process area. The review consisted of comparing the maximum alpha and beta airborne radioactivity levels reported for this period with the levels required to achieve an exposure of 40 DAC-hours. (An exposure of 40 DAC-hours will result in an intake of 2% of an ALI). It can be shown that the exposure (in DAC-hours) for an airborne radionuclide can be calculated from the following equation:

Exposure (DAC-hours) = Airborne Concentration (uCi/ml) x
[Occupancy (hours/yr) / DAC (uCi/ml)]

The total exposure would be obtained from summation of all contributing radionuclides. For WRAP, the limiting DAC values for alpha and beta emitters are those for Plutonium-239 and Strontium-90, respectively. This calculation was performed for each sampling location using the maximum alpha and beta activites from March 3, 1997 through September 30, 1998. The results are presented in Table 2, below.

Table 2: Potential Exposure based on maximum observed activity

EDP Code	Alpha Activity (uCi/ml)	Beta Activity (uCi/ml)	Exposure(DAC-hours)
W-151	5.40 E-14	1.17 E-13	54.2
W-152	4.80 E-14	2.34 E-13	48.2
W-153	3.70 E-14	7.80 E-14	37.1
W-154	1.52 E-14	2.70 E-13	15.5
W-155	1.50 E-14	1.88 E-13	15.2
W-156	1.10 E-13	2.70 E-14	110.3
W-157	2.16 E-15	2.40 E-14	2.2
W-158	1.40 E-13	5.10 E-13	140.5
W-159	4.80 E-15	2.68 E-14	0.6
W-160	5.58 E-15	3.18 E-14	0.7
W-165	3.24 E-15	1.10 E-13	3.4

EDP Code	Alpha Activity (uCi/ml)	Beta Activity (uCi/ml)	Exposure(DAC-hours)
W-166	4.62 E-15	2.77 E-14	4.6
W-167	2.57 E-15	2.55 E-14	2.6
W-168	3.33 E-15	7.36 E-14	3.4
W-169	1.86 E-15	1.07 E-13	2.0
W-170	3.14 E-15	6.05 E-14	3.2
W-171	3.00 E-14	5.30 E-14	30.1
W-172	4.45 E-15	3.20 E-14	4.5
W-173	None Observable	2.70 E-14	0.1
W-174	2.63 E-15	4.44 E-14	2.7
W-175	2.98 E-15	9.51 E-14	3.1
W-176	2.62 E-15	3.54 E-14	2.7
W-177	6.20 E-15	2.69 E-14	6.2
W-178	6.20 E-15	2.95 E-14	6.2
W-179	1.60 E-13	4.80 E-13	160.5
W-180	2.80 E-13	6.90 E-13	280.7
W-181	1.30 E-13	8.30 E-13	130.8
W-182	None Observable	1.85 E-14	0.1
W-183	5.80 E-15	2.20 E-14	5.8
W-184	2.70 E-15	1.32 E-15	2.7
W-185	1.30 E-13	2.60 E-13	130.3

It must be noted that the results of table 2 are not reflective of any actual internal exposures at WRAP. Using the maximum observed concentration at a location is an extremely conservative approach to access the criteria of 2% ALI (40 DAC-hrs) for WAM.

6.3 BUILDINGS/ROOMS THAT REQUIRE WAM

Based upon the Workplace Air Monitoring Evaluation (Attachment 1), there are three areas in the 2336-W building that require WAM. They are; the Shipping/Receiving Area, the NDE/NDA Area, and the Process Area. In the annual updates to this document; need, placement, and upgrades as necessary will be evaluated. The following instruments will be used as the WAM system for WRAP:

2336-W/Room 101

This is the primary storage area for waste containers. Normal operations include; off loading waste containers from trucks, movement of waste containers by forklifts, utilizing drum grappling devices from cranes and powered equipment, and assembling drums into TRUPACTs. During an accident scenario, the potential to release radioactive materials is credible. Since people must work in close proximity to the containers, they may be exposed to radiological hazards. The potential dose from an unplanned release (mechanical, fire, explosion or earthquake) could be up to a REM HNF-SD-W026-SAR-002 *Waste Receiving and Processing Facility Final Safety Analysis Report* (SAR) Section 3.3.2.3.3. Worker Protection. The initiation frequency from table 3-18 of the SAR is 1.00 E+00/yr for a mechanical breach. Other accidents have much smaller initiation frequencies but have similar consequences. This mechanical breach accident is the bounding case for unplanned release for room 101. A dose of one rem would equate to 400 DAC-hrs, greatly exceeding the criteria of 4 DAC-hrs for an unplanned release in a 4 hour working shift. Continuous Air Monitoring to alert workers of elevated airborne activity levels is required.

Currently two CAMs are located along the North wall of room 101. The PNNL Air Flow Evaluation for this room recommended that the air samplers be located in the West end of the room near potential release points. Using Table 1 of HNF-PRO-331, the purpose of sampling/monitoring in room 101 is to provide early warning of elevated airborne release(s). Placement of these CAMs should be between worker(s) and release points. Therefore the new proposed location for the CAMs are near the empty drum conveyor. The proposed location is on the air flow map (page 19). Engineering Change Notice 639520 has been initiated to move these CAMs to the proposed locations.

2336-W/Room 104

This is the examination area by non-destructive means for waste containers. Normal operations include; non-destructive examination/non-destructive assay of drums and boxes. The accident scenarios are identical for this room as for room 101. Also, the ventilation system for this room is shared with room 101. This ventilation system utilizes recirculation to supplement the supply ventilation. Therefore, for these and the reasons stated for room 101, Continuous Air Monitoring is required.

Currently two CAMs are located along the Automated Guided Vehicle (AGV) Aisle between the drum NDE and drum NDA units. The PNNL Air Flow Evaluation for this room reported that based on the air flow patterns observed both with the ventilation on and off, that the current air sampler locations appear to be adequate. The locations of the air samplers is included on the air flow map (page 20).

2336-W/Room 107

This is the glovebox processing area for drum waste containers. Normal operations include: operating the four glovebox lines, lag storage of drum waste containers, and various maintenance activities outside of the glovebox enclosures (warm maintenance room). During an accident scenario, the potential to release radioactive materials is credible. Since people must work in close proximity to the containers (through glove ports and hands on with newly generated waste containers) they may be exposed to radiological hazards. The potential dose from an unplanned release (mechanical, fire, explosion or earthquake) could be up to a rem (SAR Section 3.3.2.3.3. Worker Protection). The scenario with the greatest potential would be a drum explosion in a process area outside the gloveboxes, but the frequency of occurrence of a drum explosion from table 3-19 of the SAR is 2.00 E-03/yr. An annualized dose from this accident would be less than 2.5 mrem (1 DAC-hr). To evaluate the process area properly, the mechanical release scenario will be applied. The mechanical release scenario is based for the shipping/receiving area but is bounding for facility operations. Particularly of interest is the load out of compliant waste back into 208 l (55 gallon) and 322 l (85 gallon) drums. At these locations, full waste containers do not have their respective lids securely fastened. That evolution happens once the drums are away from the glovebox. Therefore, the mechanical release scenario will be

used to determine if the 4 DAC-hr criteria is met for Continuous Air Monitoring. The initiation frequency from table 3-18 of the SAR is 1.00 E+00/yr for a mechanical breach. A dose of one rem would equate to 400 DAC-hrs, greatly exceeding the criteria of 4 DAC-hrs for an unplanned release in a 4 hour working shift. Continuous Air Monitoring to alert workers of elevated airborne activity levels is required.

Currently eleven CAMs are located throughout the room and at exhaust points. Also, fourteen breathing zone air samplers are located on the four glovebox lines to provide sampling of the confinement barrier (gloveboxes). The Air Flow Evaluation for this room stated that the current locations for the exhaust point CAMs for the room were adequate for the observed air flow patterns (see page 22 for air flow patterns and instrument locations). Those CAMs were positioned to detect airborne concentrations from various release points. Additionally, individual work locations have CAMs based on work activity being performed. Using Table 1 of HNF-PRO-331, there are four purposes for sampling/monitoring in room 107. They are: to provide early warning of elevated airborne release(s), determine total concentration from many potential release points, test for leakage of radioactive materials from sealed confinement systems, and determine airborne radioactivity area status or respiratory protection adequacy. CAMs are placed near the exhaust points to account for the many different release points. The fourteen breathing zone air samplers are located at strategic points on the gloveboxes to identify area needing confinement control and to be used as a backup to internal dosimetry results for worker's intake. The seven "worksite" CAMs are positioned near particular work areas to detect elevated airborne levels due to the activities performed. Finally, portable grab samplers will be used on a case-by-case basis for determining airborne radioactivity area status and respiratory protection adequacy for particular evolutions. Grab Air Sampling will be performed based on the technical work document (Work package, procedure, work plan, test document, etc.) and the Radiological Work Permit.

Worksite CAM placement: Seven CAMs are placed in the process area to cover areas of likely exposure to airborne radioactivity based on credible contamination spreads from gloveboxes and entry/exit ports. These placements are described below.

TRU Process Line Operations Platform: One Alpha CAM on the operating side of the TRU process line shortly upstream in the ventilation path from the drum entry/exit port. This placement ensures that a release that resulted in airborne radioactivity exposure to personnel on the operations platform would be detected.

TRU Process Line Operations Platform: One Alpha CAM near the sorting area of the TRU line, where a glove rupture could result in an airborne release of radioactive material.

Back of TRU Process Line: Though routine operations do not occur on this side of the TRU process line, glovebox maintenance activities require the use of gloves and other process ports. An Alpha CAM is placed downstream in the ventilation path from most of these activities. Activities further down the TRU line are closer to (and upstream in the ventilation flow path from) the Alpha CAM originally installed at the west wall in the process area. This CAM at the back of the TRU process line monitors the corridor between it and the LLW process line, an area with relatively low ventilation velocity.

Operations Platform of LLW Process Line: One Beta CAM is placed downstream in the ventilation flow path of the entry/exit port and the supercompactor. Potential releases from process ports further down the process line are monitored by the Beta CAM originally placed on the west wall of the room.

Back of LLW Process Line: This placement mirrors the Alpha CAM placement on the back of the TRU line, though ventilation velocity here is relatively high. This CAM monitors maintenance activities using gloves and other process ports in the LLW line.

TRU Restricted Waste Management (RWM) Process Line: This process line is raised above the level of the platform, with open space beneath. The videotape of the original smoke testing showed that the ventilation flow strongly moved air from the breathing zone to the open space under the process line. Releases from glove ruptures would likely be drawn to the Alpha CAM which is placed approximately in the center of the line. This process line is on the west side of the room, and releases occurring downstream of the CAM would be detected by the Alpha CAM originally placed at the west wall (south side).

LLW RWM Process Line: Placement of a Beta CAM under the LLW RWM process line mirrors the placement of the Alpha CAM under the TRU RWM process line.

This placement of these CAMs reflects a conservative approach to continuous air monitoring. Placement of each was intended to result in early warning of releases of airborne radioactivity, and actual personnel exposure to airborne radioactivity would in some cases be less than the concentration detected by the CAM.

6.4 FILTER MEDIA SELECTION

From HNF-PRO-331 *Work Place Air Monitoring*, facility radiological control must choose a filter media based on emission of concern and subsequent analysis method. Of the three approved filters, the VERSAPORE 3000 will be used at WRAP.

The Versapore 3000 is a 47 mm membrane (Acrylic copolymer) on a nylon support. This filter is chemically reactive and therefore can be used for destructive analysis. The collection efficiency for 0.3 μm DOP at 32 l/minute is 95.84 percent.

The Fluoropore is a 47 mm Teflon™ membrane filter with a polypropylene support. This filter is not appropriate for destructive analysis. The collection efficiency for this filter is 99.99 percent as identified under DOE contract DE-AC04-76EV01013. Sample collection occurs on the smooth side of this filter. As the two filter sides are nearly indistinguishable, facility personnel must take care to assure appropriate collection. Millipore manufactures these filters.

The air samples at WRAP will predominately be analyzed for both alpha and beta emissions. Since the Versapore 3000 can be used for destructive analysis, this is the filter of choice. However, for the application of alpha spectrometry (including Alpha CAMs with spectrometry software), Fluoropore FS sample media may be used.

7.0 REFERENCES

10 CFR 835, *Occupational Radiation Protection.*

DOE 5482.1B, *Environmental, Safety, and Health Appraisal Program.*

G-10 CFR 835/E2, *Workplace Air Monitoring.*

HSRCM-1, *Hanford Site Radiological Control Manual.*

NUREG 1400, *Air Sampling in the Workplace.*

FDH, Radiation Protection Technical Basis TBTN#PBGH-9608-MCC-0062, *PIC Work Place Air Monitoring.*

FDH, Radiation Protection Technical Basis TBTN#CDGH-9608-MCC-0079, *CDMP Work Place Air Monitoring Standards.*

HNF-PRO-331 *Work Place Air Monitoring*

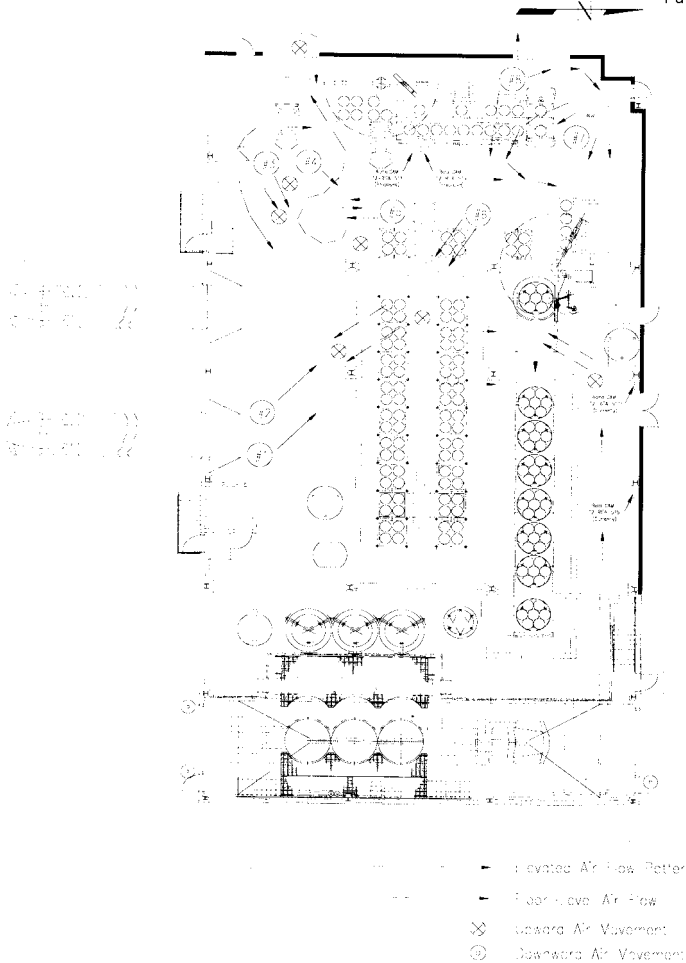
HNF-SD-W026-SAR-002, *Waste Receiving and Processing Facility Final Safety Analysis Report.*

Letter from Eva Eckert Hickey to Rick Swallow; *Evaluation of Air Flow Patterns in Rooms 101 and 104 of the WRAP-1 Facility.*

Letter from Mark Fishburn to Rick Swallow, 97MRF008; *Evaluation of Air Flow Patterns in Rooms 107 and 113 of the WRAP Facility.*

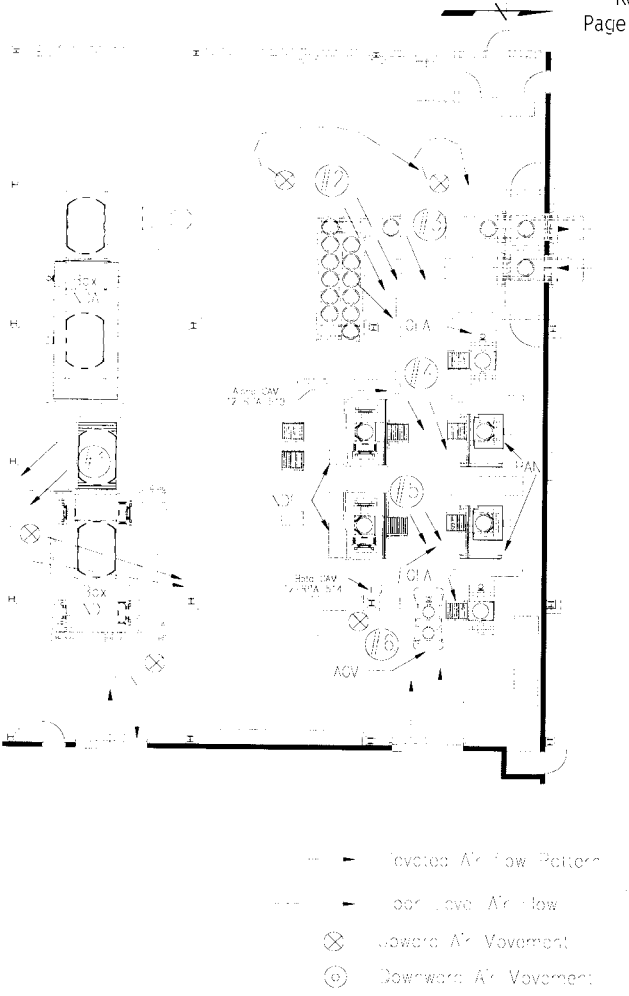
Letter 32640-98-DNS-055 from D. N. Stewart to J. R. Weidert; *INTERIM TECHNICAL BASIS FOR CONTINUOUS AIR MONITORING IN THE WRAP PROCESSING AREA* September 9, 1998.

Letter 32640-98-DNS-061 from D. N. Stewart to L. W. Roberts; *REVISED INTERIM TECHNICAL BASIS FOR CONTINUOUS AIR MONITORING IN THE WRAP PROCESSING AREA* September 17, 1998.



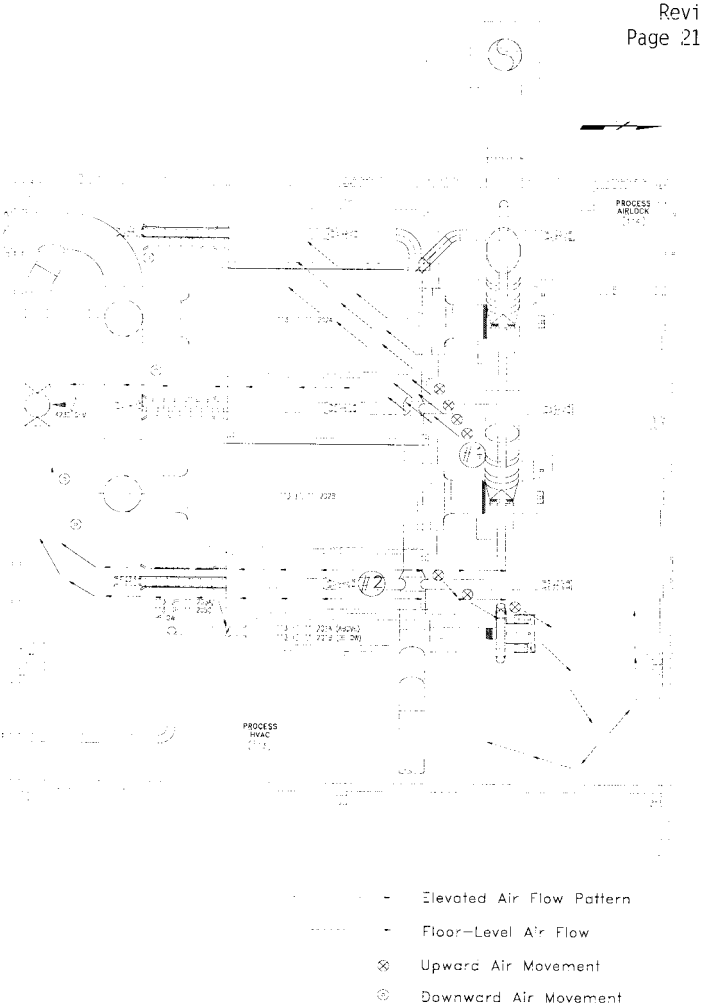
2336-W/Rm 101 Shipping/Receiving

Air Flow Patterns for WRAP (PNNL letter)



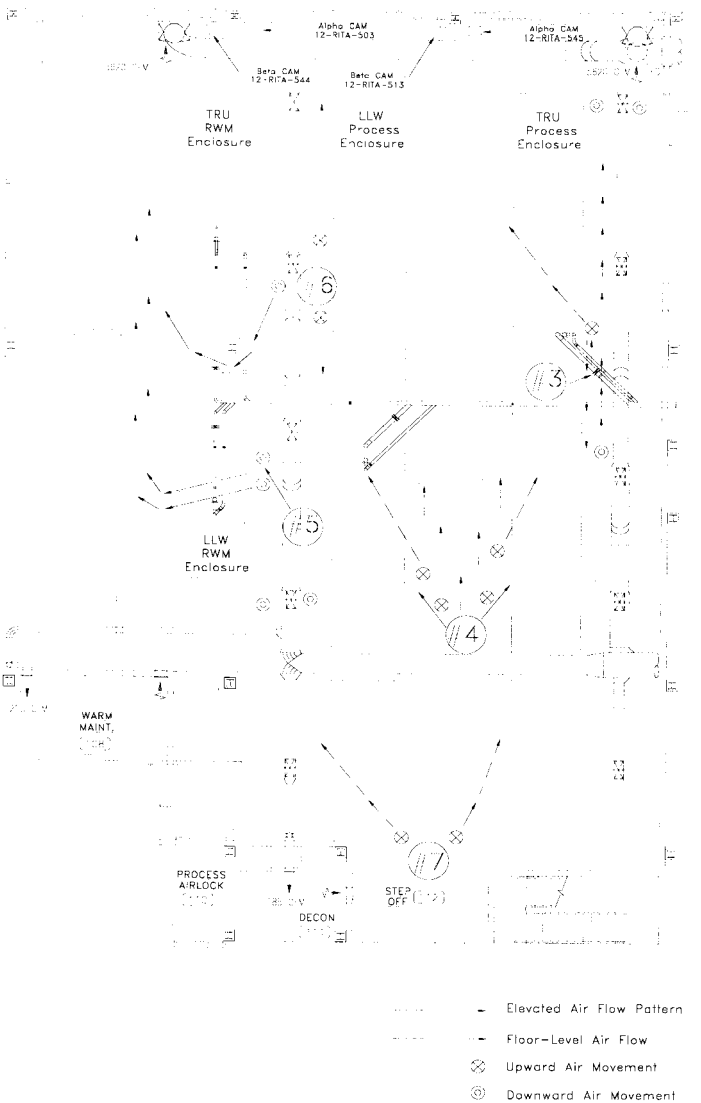
2336-W/Rm 104 NDE/NDA

Air Flow Patterns for WRAP (PNNL letter)



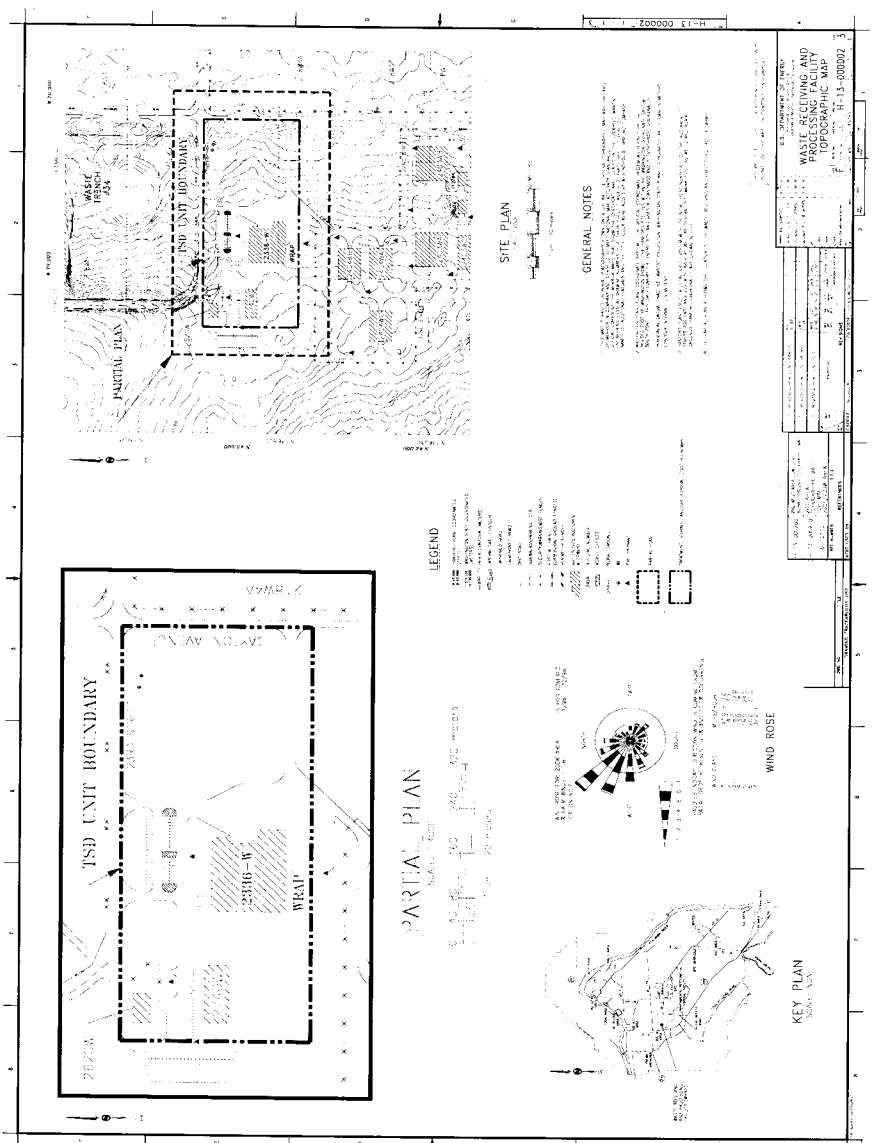
2336-W/Rm 113 Process HVAC

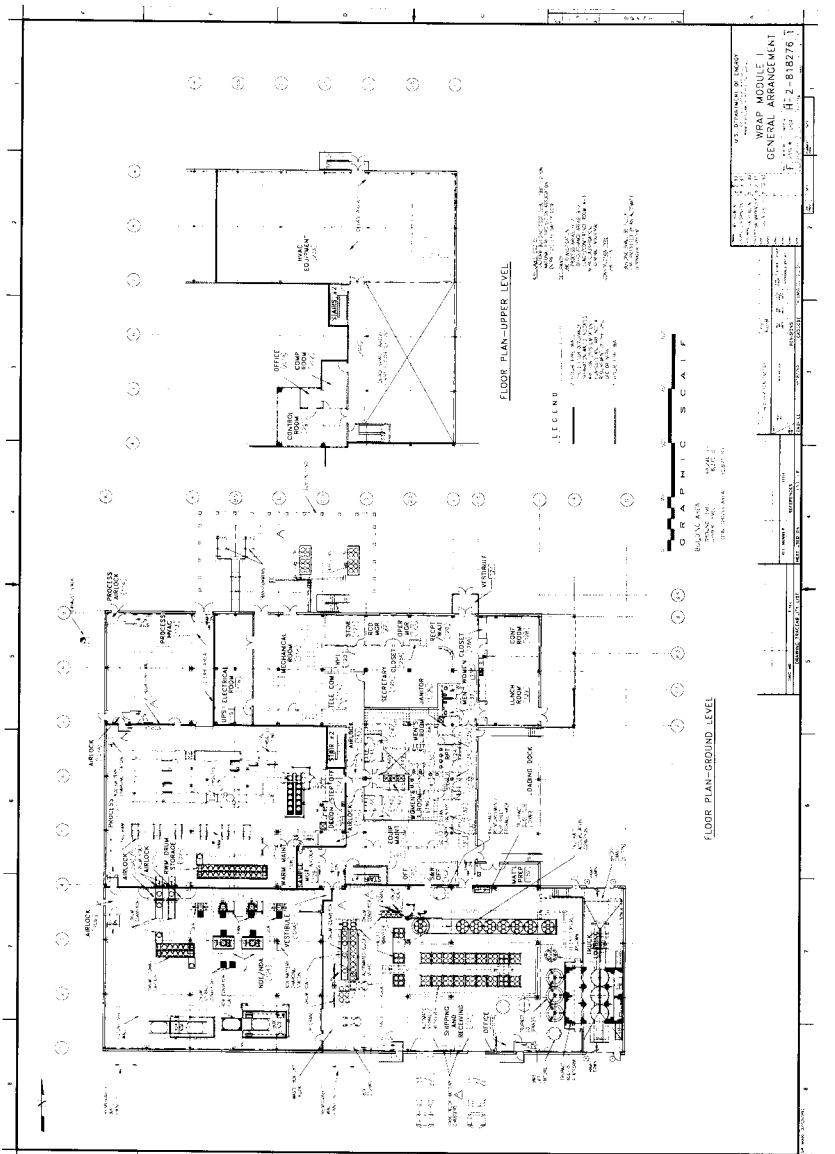
Air Flow Patterns for WRAP (97MRF008 letter)



2336-W/Rm 107 Process

Air Flow Patterns for WRAP (97MRF008 letter)


WASTE RECEIVING AND PROCESSING FACILITY
TOPOGRAPHIC MAP
H-13-000002
GENERAL NOTES
SITE PLAN
LEGEND
PARTIAL PLAN
TSD UNIT BOUNDARY
2336-W
WEAP
WIND ROSE
KEY PLAN


WRAP MODULE I
GENERAL ARRANGEMENT
H-2-818276
FLOOR PLAN-UPPER LEVEL
FLOOR PLAN-GROUND LEVEL
LEGEND
GRAPHIC SCALE

ATTACHMENT 1 Workplace Air Monitoring Evaluation

1.0 Purpose

The purpose of this attachment is to provide additional justification and background for the Workplace Air Monitoring (WAM) decisions placed forth in text of document HNF-SD-W026-TA-002.

2.0 Criteria

The criterion was previously described in the document. The following is a summary of what the Waste Receiving and Processing facility (WRAP) were evaluated against:

A. Occupancy - areas which personnel are present greater than 90 minutes per day.

B. Source Term - The presence of radioactive material.

C. Potential to exceed 2% of an ALI - Ability of the source term to exceed 2% of an ALI to Personnel.

D. Potential to exceed 8 DAC-hrs in a work shift - ability of the source term to expose personnel to greater than 8 DAC-hrs in a working shift (an expected airborne exposure in contrast to an unplanned increase).

E. Potential for a 4 DAC-hr unplanned increase in a working shift. (This is the determination level where a continuous air monitor is required in the workplace.)

3.0 Evaluation

Each of the buildings of the WRAP complex was evaluated against the criteria for WAM. The result for each category is summarized in the table concluding this attachment.

Occupancy

This requirement was addressed by performing an occupancy study of the fifty-eight rooms/areas of the WRAP complex. The study entailed interviews with first line supervisors for WRAP. Thirty-three rooms/areas were determined to meet the 90 min/day occupancy for further evaluation. Results of that study are presented in table 1.0.

Table 1.0 Occupancy Study

Location	Description	RCTs hours/wk	Time in Area Ops hours/wk	Maint. hours/wk	Others hours/wk
2620-W	Maintenance Support Building	4	0	25	25
2740-W	Administrative Support Building	0	4	22.5	40
2336-W/100, 101,101A	Truck Loading, Shipping/Receiving and S/R Office	30	40	15	5
2336-W/102	Operations Office	1	40	0.5	1
2336-W/103	Counting Office	40	2	0.5	5
2336-W/104, 104A, 105, 105A	NDE/NDA, Vestibule NDE/NDA, Outfeed Airlock, Infeed Airlock	30	40	17.5	20
2336-W/106	NDE/NDA Airlock	0	0	0.5	0
2336-W/107, 108, 111, 112	Process Area, Warm Maintenance, Decon Station, Step Off	40	40	20.5	25
2336-W/107A	Process/Process HVAC Airlock	0	4	3	0
2336-W/109	Sample Management	0	4	0.5	10
2336-W/110	Process Equipment Airlock	0	0	0.5	0
2336-W/113	Process HVAC Area	4	2	5	1
2336-W/114	Process HVAC Airlock	0	0	2.5	0
2336-W/115	UPS	0	0	12	0
2336-W/116	Electrical	0	0	9.5	1
2336-W/117	North Hallway	1	1	5.5	1
2336-W/118	Mechanical	0	2	10	1
2336-W/119	Telephone/Communications	0	0	3	1
2336-W/120	Radcon Manager's Office	40	2	1	40
2336-W/121	Operations Lead Office	4	40	1	40
2336-W/122	Operations Manager's Office	1	40	2.5	40
2336-W/123	Plant Manager's Office	4	40	3	40
2336-W/124	ACES	40	0	9	2
2336-W/125	Secretary Bay	40	8	4.5	40
2336-W/125A	Closet	0	0	10	1
2336-W/126	Reception Area	4	8	1.5	40
2336-W/127	Vestibule	0	0	0.5	1
2336-W/128	Conference Room	12	20	3	40
2336-W/128A	Closet	1	0	4	0
2336-W/129	Lunch Room	7	8	7	12
2336-W/130	East Hallway	1	2	8	1

Location	Description	RCTs hours/wk	Time in Area Ops hours/wk	Maint. hours/wk	Others Hours/wk
2336-W/131	Soiled Laundry	0	1	0	0
2336-W/132	Mask Station	0	1	0	0
2336-W/133	Entryway to Women's Locker Room	0	0	0	0
2336-W/134	Storage	0	0	0.5	0
2336-W/135	**Entryway to Men's Locker Room**	0	0	**16**	0
2336-W/136	Janitor Room	0	0	0	5
2336-W/137	**Men's Restroom**	1	4	**21**	1
2336-W/138	Women's Restroom	1	4	0	1
2336-W/139	**Equipment Maintenance**	0	0	**14.5**	1
2336-W/140	Women's Locker Room	1	4	0	1
2336-W/141	Women's Restroom	1	4	0	1
2336-W/142	Women's Shower	1	2	0	0
2336-W/143	Entryway to Women's SWP Change Area	0	0	0	0
2336-W/144	Women's SWP Change Area	1	2	0	0
2336-W/145	Process Area Personnel Airlock	0	1	2.5	1
2336-W/146	**Men's SWP Change Area**	1	2	**13.5**	1
2336-W/146A	Storage	0	0	0	0
2336-W/147	Entryway to Men's SWP Change Area	0	0	3	0
2336-W/148	**Men's Locker Room**	1	4	**16**	1
2336-W/149	Men's Shower	1	2	4	1
2336-W/150	**Men's Restroom**	1	4	**16**	1
2336-W/151	South Hallway	0	1	3	1
2336-W/152	Material Preparation	0	2	1	1
2336-W/200	**Second Floor Hallway**	0	0	**10.5**	1
2336-W/201	**Control Room**	1	**40**	15.5	30
2336-W/201A	**Control Room Operator Station**	1	**40**	1.5	2
2336-W/202	**Computer Room**	0	4	5	**10**
2336-W/203	**HVAC Equipment**	0	4	**17**	4

Source Term

Radioactive material that could be dispersed during operation or during an accident was considered as source term. All fifty-eight rooms/areas of the WRAP Complex considered in the evaluation. Only eight rooms/areas meet the source term requirement. Of those, only five meet the occupancy requirements. These five are: 2336-W/100, 101, & 101A, 2336-W/104, 104A, 105, & 105A, 2336-W/107, 108, 111, & 112, 2336-W/109, and 2336-W/146.

Potential to Exceed 2% of an ALI

Each of the source terms were evaluated to determine if they have enough material to exposure the maximum exposed worker to 2% of an ALI. This was done by; evaluating air sample data and examining accidents from the SAR on a annualized basis.

Potential to Exceed 8 DAC-hrs in a Working Shift

Each room that had the potential to exceed 2% of an ALI was evaluated for an 8 DAC-hr exposure to the maximum exposed worker in a working shift. This is an expected exposure rather than a unplanned increase (accident). It must be noted that as WRAP continues to ramp-up to full production, air sample concentrations may vary due to increased operational activities in the process area. The review consisted of comparing the maximum alpha and beta airborne radioactivity levels reported for this period and propogated them over a 8 hour working shift. It can be shown that the exposure (in DAC-hours) for an airborne radionuclide can be calculated from the following equation:

Exposure (DAC-hours) = Maximum Airborne Concentration (uCi/ml) x [8 hrs / DAC (uCi/ml)]

The total exposure would be obtained from summation of all contributing radionuclides. For WRAP, the limiting DAC values for alpha and beta emitters are those for Plutonium-239 and Strontium-90, respectively. This calculation was performed for each sampling location using the maximum alpha and beta activites from March 3, 1997 through September 30, 1998. The results are presented in Table 2, below.

Table 2: Potential Exposure based on maximum observed activity

EDP Code	Alpha Activity (uCi/ml)	Beta Activity (uCi/ml)	Exposure (DAC-hours
W-151	5.40 E-14	1.17 E-13	0.216468
W-152	4.80 E-14	2.34 E-13	0.192936
W-153	3.70 E-14	7.80 E-14	0.148312
W-154	1.52 E-14	2.70 E-13	0.06188
W-155	1.50 E-14	1.88 E-13	0.060752
W-156	1.10 E-13	2.70 E-14	0.44108
W-157	2.16 E-15	2.40 E-14	0.008736
W-158	1.40 E-13	5.10 E-13	0.56204
W-159	4.80 E-15	2.68 E-14	0.019307
W-160	5.58 E-15	3.18 E-14	0.022447
W-165	3.24 E-15	1.10 E-13	0.0134
W-166	4.62 E-15	2.77 E-14	0.018591

EDP Code	Alpha Activity (uCi/ml)	Beta Activity (uCi/ml)	Exposure (DAC-hours
W-167	2.57 E-15	2.55 E-14	0.010382
W-168	3.33 E-15	7.36 E-14	0.013614
W-169	1.86 E-15	1.07 E-13	0.007868
W-170	3.14 E-15	6.05 E-14	0.012802
W-171	3.00 E-14	5.30 E-14	0.120212
W-172	4.45 E-15	3.20 E-14	0.017928
W-173	None Observable	2.70 E-14	0.000108
W-174	2.63 E-15	4.44 E-14	0.010698
W-175	2.98 E-15	9.51 E-14	0.0123
W-176	2.62 E-15	3.54 E-14	0.010622
W-177	6.20 E-15	2.69 E-14	0.024908
W-178	6.20 E-15	2.95 E-14	0.024918
W-179	1.60 E-13	4.80 E-13	0.64192
W-180	2.80 E-13	6.90 E-13	1.12276
W-181	1.30 E-13	8.30 E-13	0.52332
W-182	None Observable	1.85 E-14	0.000074
W-183	5.80 E-15	2.20 E-14	0.023288
W-184	2.70 E-15	1.32 E-15	0.010805
W-185	1.30 E-13	2.60 E-13	0.52104

It must be noted that the results of table 2 are not reflective of any actual internal exposures at WRAP. Using the maximum observed concentration at a location is an extremely conservative approach to access the criteria of 8 DAC-hr in a working shift.

Potential for 4 DAC-hr Unplanned Increase in a Working Shift

The accidents scenarios from the WRAP SAR were used to determine if a 4 DAC-hr unplanned increase in a working shift.

All of the accident scenarios involved waste containers or gloveboxes as the source of the radioactivity. The bounding consequence was 6.2 E+01 rem Effective Dose Equivalent (EDE) and a nominal consequence of 1.3 E+01 rem EDE for the Design Basis Earthquake, *Table 3-30 Dose Consequences and Evaluation Guidelines for a Design Basis Earthquake* (SAR). This is at a receptor location of 100 meters from the facility. This receptor is an individual that is in the path of the radioactive plume without any mitigation. Workers in the actual accident area (inside of WRAP) would terminate work activities immediately upon discovery, and evacuate the affected area. Estimated doses of up to one rem are mentioned in section 3.3.2.3.3 Worker Safety of the SAR for all three types of accidents (mechanical breach, fire, fire/explosion). To determine the potential consequences from the various accident scenarios, the six bounding radiological accidents (nominal consequences) were calculated from the SAR. This is a

"bounding" estimate of maximum exposure potential from the accident. It is not intended to estimate an individual workers exposure from the accident. The results of those calculations on an annualized basis are presented below.

From Section 3.4.2.1 Mechanical Release From Container Handling Accident (SAR)

5.7 E-05 PE-Ci x 1.4 E+08 mrem/Ci x 1.00 /yr = 7980 mrem

From Section 3.4.2.2 Fire Resulting From Drum handling Accident (SAR)

3.6 E-03 PE-Ci x 1.4 E+08 mrem/Ci x 2 E-03 /yr = 1008 mrem

From Section 3.4.2.3 Explosion Resulting From Container Handling Accident (SAR)

9.4 E-03 PE-Ci x 1.4 E+08 mrem/Ci x 3 E-03 /yr = 3948 mrem

From Section 3.4.2.4 Fire In Process Enclosure - Glovebox (SAR)

2.7 E-03 PE-Ci x 1.4 E+08 mrem/Ci x 2 E-03 /yr = 756 mrem

From Section 3.4.2.5 Explosion in Process Enclosure - Glovebox (SAR)

8.4 E-03 PE-Ci x 1.4 E+08 mrem/Ci x 3 E-03 /yr = 3528 mrem

From Section 3.4.2.8 Design-Basis Earthquake (SAR)

1.1 E-02 PE-Ci x 1.4 E+08 mrem/Ci x 1 E-03 /yr = 1540 mrem

The three operating areas of WRAP are bounded by these accidents. Those areas are, Shipping/Receiving Area Rm 101, NDE/NDA Area Rm 104, and the Process Area Rm 107. Those three areas previously met the potential to exceed 2% of an ALI based on air sample data. Since the criteria of a 4 DAC-hr exposure equates to 10 mrem of dose, these accidents are more than likely to produce that dose to a plant worker in the affected area. The statement in the SAR of doses up to one rem seems reasonable. Therefore, these three area were waste containers are stored and process meet the 4 DAC-hr criteria for an un-planned release and require continuous air monitoring.

Dual Enclosure

The dual enclosure criterion was evaluated by determining the confinement of incoming waste containers and the containment of the glovebox enclosures (including coupling drums to the glovebox and decoupling activities). Where drums from the gloveboxes do not have a strong-tight lid in place, the dual enclosure criterion is not met.

The following table summarizes these criteria for the fifty-eight rooms/areas of the WRAP complex. The highlighted rooms/areas require WAM.

Building/ Room	Operation/ Description	Occupancy Not Occupied(N) (<90 min/day) Infrequent(I) (>90 min/day) Continuously(C) (2000hrs/yr)	Source Term (Y/N)	Potential to exceed 2% ALI? (Y/N)	Potential to Exceed 8 DAC-hours in a shift? (Y/N)	Potential for 4 DAC-hour unplanned increase in a shift? (Y/N)	Dual enclosure system? (Y/N)
2620-W/All	Maintenance Support Building	I	N In HNF-SD-W026-SAR-002 Executive Summary, states that no radiological materials are handled in 2620-W.	N	N	N	N/A
2740-W/All	Admin. Support Building	C	N In HNF-SD-W026-SAR-002 Executive Summary, states that no radiological materials are handled in 2740-W.	N	N	N	N/A
2336-W/100 **2336-W/101** **2336-W/101A**	**Truck Loading** **Shipping/ Receiving Area** **S/R Office**	C	Y Waste containers are stored/shipped in this area.	Y	Y	Y	Y
2336-W/102	Operations Office	C	N Radioactive Material is not stored in this room. Additionally this room has a separate ventilation feed from the administrative area of WRAP.	N	N	N	N/A

Building/ Room	Operation/ Description	Occupancy Not Occupied(N) (<90 min/day) Infrequent(I) (>90 min/day) Continuously(C) (2000hrs/yr)	Source Term (Y/N)	Potential to exceed 2% ALI? (Y/N)	Potential to Exceed 8 DAC-hours in a shift? (Y/N)	Potential for 4 DAC-hour unplanned increase in a shift? (Y/N)	Dual enclosure system? (Y/N)
2336-W/103	Counting Office	C	N Only radioactive sealed sources and previously surveyed samples (filter papers) are used/stored in this room.	N	N	N	N/A
2336-W/104 2336-W/104A 2336-W/105 2336-W/105A	NDE/NDA Area Vestibule NDE/NDA Outfeed Airlock Infeed Airlock	C	Y Waste containers are stored and examined in this area.	Y	Y	Y	Y
2336-W/106	NDE/NDA Airlock	N	N Radioactive materials are not stored in this room.	N	N	N	N/A
2336-W/107 2336-W/108 2336-W/111 2336-W/112	Process Area Warm Maintenance Decon Station Step Off	C	Y Glovebox operations with drum waste containers (sorting of contents).	Y	Y	Y	N

Building/ Room	Operation/ Description	Occupancy Not Occupied(N) (<90 min/day) Infrequent(I) (>90 min/day) Continuously(C) (2000hrs/yr)	Source Term (Y/N)	Potential to exceed 2% ALI? (Y/N)	Potential to Exceed 8 DAC-hours in a shift? (Y/N)	Potential for 4 DAC-hour unplanned increase in a shift? (Y/N)	Dual enclosure system? (Y/N)
2336-W/109	Sample Management	I	Y Radioactive Material is stored in Sample Transport Containers.	N Samples are not removed from the Sample Transport Containers.	N	N	Y
2336-W/110	Process Equipment Airlock	N	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/113	Process HVAC Area	N	Y Radioactive Material is present on the HEPA filters.	N	N	N	N/A
2336-W/114	Process HVAC Airlock	N	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/115	UPS	I	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/116	Electrical	I	N Radioactive Material is not stored in this room.	N	N	N	N/A

Building/ Room	Operation/ Description	Occupancy Not Occupied(N) (<90 min/day) Infrequent(I) (>90 min/day) Continuously(C) (2000hrs/yr)	Source Term (Y/N)	Potential to exceed 2% ALI? (Y/N)	Potential to Exceed 8 DAC-hours in a shift? (Y/N)	Potential for 4 DAC-hour unplanned increase in a shift? (Y/N)	Dual enclosure system? (Y/N)
2336-W/117	North Hallway	N	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/118	Mechanical	I	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/119	Telephone/ Communications	N	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/120	Radcon Managers Office	C	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/121	Operations Lead Office	C	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/122	Operations Managers Office	C	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/123	Plant Managers Office	C	N Radioactive Material is	N	N	N	N/A

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			not stored in this room.				
2336-W/124	ACES Office	C	N Only sealed sources and previously surveyed samples are stored/processed in this room.	N	N	N	N/A
2336-W/125	Secretary Bay	C	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/125A	Closet	I	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/126	Reception Area	C	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/127	Vestibule	N	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/128	Conference Room	C	N Radioactive Material is not stored in this room.	N	N	N	N/A

Building/ Room	Operation/ Description	Occupancy Not Occupied(N) (<90 min/day) Infrequent(I) (>90 min/day) Continuously(C) (2000hrs/yr)	Source Term (Y/N)	Potential to exceed 2% ALI? (Y/N)	Potential to Exceed 8 DAC-hours in a shift? (Y/N)	Potential for 4 DAC-hour unplanned increase in a shift? (Y/N)	Dual enclosure system? (Y/N)
2336-W/ 128A	Closet	N	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/129	Lunch Room	I	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/130	East Hallway	I	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/131	Used SWP Laundry Storage	N	Y Used SWP Laundry is considered radioactive material.	N No removable contaimi-nation is allowed to/from laundry facility.	N	N	N/A
2336-W/132	Mask Station	N	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/133	Entryway to	N	N	N	N	N	N/A

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	Women's Locker room		Radioactive Material is not stored in this room.				
2336-W/134	Clean SWP Laundry Storage	N	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/135	Entryway to Men's Locker room	I	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/136	Janitor Room	N	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/137	Men's Restroom	I	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/138	Women's Restroom	N	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/139	Equipment Maintenance	I	N Radioactive Material is not stored in this room.	N	N	N	N/A

Building/ Room	Operation/ Description	Occupancy Not Occupied(N) (<90 min/day) Infrequent(I) (>90 min/day) Continuously(C) (2000hrs/yr)	Source Term (Y/N)	Potential to exceed 2% ALI? (Y/N)	Potential to Exceed 8 DAC-hours in a shift? (Y/N)	Potential for 4 DAC-hour unplanned increase in a shift? (Y/N)	Dual enclosure system? (Y/N)
2336-W/140	Women's Locker room	N	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/141	Women's Restroom	N	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/142	Women's Shower	N	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/143	Entryway to Women's SWP Change Area	N	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/144	Women's SWP Change Area	N	Y	N No removable contaimi-nation is allowed from laundry facility.	N	N	N/A
2336-W/145	Process Area Personnel Airlock	N	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/146	Men's SWP	I	Y	N	N	N	N/A

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	Change Area			No removable contaimi-nation is allowed from laundry.			
2336-W/146A	Storage	N	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/147	Entryway to Men's SWP Change Area	N	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/148	Men's Locker room	I	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/149	Men's Shower	N	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/150	Men's Restroom	I	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/151	South Hallway	N	N Radioactive Material is	N	N	N	N/A

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			not stored in this room.				
2336-W/152	Material Preparation	N	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/200	Second Floor Hallway	I	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/201	Control Room	C	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/201A	Dispatch Office	C	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/202	Computer Room	I	N Radioactive Material is not stored in this room.	N	N	N	N/A
2336-W/203	HVAC Equipment	I	N Radioactive Material is not stored in this room.	N	N	N	N/A

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Project Title/Work Order		EDT No. N/A
Technical Assessment of Compliance with Workplace Air Sampling Requirements at WRAP		ECN No. ECN-651650

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