Beaver Valley Power Station - Units 1 & 2

Annual Radioactive Effluent Release Report

Calendar Year - 2006 Attachment 2 Unit 1 and 2 Offsite Dose Calculation Manual Changes

Attachment 2

Attached is a complete copy of the ODCM that includes:

Change (22) of the ODCM (Effective: August, 2006) Change (23) of the ODCM (Effective: December, 2006)

Attachment 2 Clarification

A complete copy of the ODCM has been provided to the following offices:

United States Nuclear Regulatory Commission Attention: Document Control Desk Washington, DC 20555-0001

United States Nuclear Regulatory Commission Regional Administrator 475 Allendale Road King of Prussia, PA 19406

For a complete copy of the ODCM, contact Mr. Anthony T Lonnett at 724-682-7523.

Beaver Valley Power Station

Unit 1/2

1/2-ODC-1.01

ODCM: Index, Matrix and History of ODCM Changes

Document Owner Manager, Nuclear Environmental and Chemistry

Revision Number	5
Level Of Use	General Skill Reference
Safety Related Procedure	Yes

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1.0 <u>P</u>	URPOSE		
1.1 T	his procedure provides an index for the entire Offsite Dose Ca	lculation	Manual (ODCM).
1.2 T	his procedure also provides an historical description of all cha	nges to th	e ODCM.
To su O	his procedure also contains a matrix of plant procedure referer echnical Specifications (RETS), Radiological Environmental I urveillances that were transferred from the Technical Specifica DCM via Change (8) and Change (16).	Monitorin ition Proce	g Program (REMP) edure Matrix to the
1.3.1	Prior to issuance of this procedure, these items were located of the old ODCM.	d in the In	dex and Appendix F
1.3.2	The numbering of each specific ODCM Controls, ODCM S and ODCM Controls Tables contained in this procedure do This is intentional, as all ODCM Controls, ODCM Surveill ODCM Controls Tables numbers remained the same when the Technical Specifications Procedure Matrix. This was d the amount of plant procedure changes and to eliminate any numbering changes.	es not app ance Requ they were one in an	ear to be sequential. urements and transferred from effort to minimize
2.0 <u>S</u>	COPE		
	his procedure is applicable to all station personnel that are qua escribed and referenced in this procedure.	lified to p	erform activities as
3.0 <u>R</u>	EFERENCES AND COMMITMENTS		
3.1 <u>R</u>	eferences Used in This Procedure		
3.1.1	NUREG-0472, Draft 7 for Rev. 3, Standard Radiological E	ffluent Te	chnical

- Specifications For PWRs September, 1982.
 3.1.2 NUREG-0133, Preparation Of Radiological Effluent Technical Specifications For
- 3.1.2 NUREG-0133, Preparation Of Radiological Effluent Technical Specifications For Nuclear Power Plants, October, 1978.
- 3.1.3 Generic Letter 89-01, Implementation Of Programmatic Controls For Radiological Effluent Technical Specifications In The Administrative Controls Section Of The Technical Specifications And The Relocation Of Procedural Details Of RETS To The ODCM Or To The PCP, January 31, 1989.
- 3.1.4 NUREG-1301, Offsite Dose Calculation Manual Guidance: Standard Radiological Effluent Controls For Pressurized Water Reactors, Generic Letter 89-01, Supplement No. 1, April, 1991.
- 3.1.5 1/2-ODC-3.03, ODCM: Controls for RETS and REMP Programs

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3.1.6	1/2-ADM-1640, Control of the Offsite Dose Calculation	n Manual			
3.1.7	1/2-ADM-0100, Procedure Writer's Guide	DM-0100, Procedure Writer's Guide			
3.1.8	NOP-SS-3001, Procedure Review and Approval				
3.1.9	CR04-09895, Missed ODCM Channel Functional Test CA-04, Revise ODCM procedure 1/2-ODC-1.01, Attack the Channel Functional Test requirements for the Unit 1 Devices delineated in ODCM procedure 1/2-ODC-3.03 being met by Form 1/2-ENV-01.04.F01 instead of 1MS	hment C, Tab Sampler Flo , Attachment	le F:3a to show that wrate Measuring		
3.1.10	CR05-01169 Chemistry Action Plan For Transition of F 14 thru CA-21, Revise ODCM procedures to change do Radiation Protection" to Manager Nuclear Environment	cument owne	r from "Manager,		
3.1.11	procedure 1/2-ODC-2.01 to update the alarm setpoints of 1DA-100] for incorporation of the Extended Power Upr No. 275. Also, CA-04; revised ODCM procedure 1/2-O	6-04908, Radiation Monitor Alarm Setpoint Discrepancies. CA-03; revise ODCM edure 1/2-ODC-2.01 to update the alarm setpoints of [RM-1RM-100] and [RM- -100] for incorporation of the Extended Power Uprate per Unit 1 TS Amendment 275. Also, CA-04; revised ODCM procedure 1/2-ODC-2.02 to add a"≤" designation alarm setpoints for Unit 1 and Unit 2 low range noble gas effluent monitors.			
3.1.12	CR06-6476, Procedure 1/2-ODC-2.01 Needs Revised for ODCM procedure 1/2-ODC-2.01 to update the alarm se incorporation of the Extended Power Uprate per Unit 2	tpoints of [2S	WS-RQ101] for		
3.2 <u>Su</u>	nmary of References Used Throughout Other Procedures	of the ODCN	<u>1</u>		
3.2.1	BVPS-1 and 2 UFSAR:				
3.2.	.1 BVPS-1 UFSAR Section 11.2.3; Gaseous Waste	Disposal Syst	em		
3.2.	.2 BVPS-1 UFSAR Section 11.2.4; Liquid Waste Di	isposal Systen	n		
3.2.3	.3 BVPS-2 UFSAR Section 11.2; Liquid Waste Mar	nagement Syst	ems		
3.2.	.4 BVPS-2 UFSAR Section 11.3; Gaseous Waste M	anagement Sy	vstems		
3.2.2	Condition Reports:	: 			
3.2.2	.1 CR 971578, MEMBERS OF THE PUBLIC Discr 4 of the ODCM to clarify how doses due to efflue (conducting activities inside the site boundary) are	ents for memb	ers of the public		
	.2 CR 980129, ODCM Procedure Matrix Discrepand				

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3.2.2.3	CR 980353, EPMP 2.01 Discrepancies for Envi CA-01, Revise Section 3 of the ODCM to corresectors.		
3.2.2.4	CR 981488, Chemistry Related ODCM Procedu References. CA-01, Revise ODCM Appendix I references.		
3.2.2.5	CR 981489, ODCM Table 4.11-2 Row A (Was Tritium). CA-01, Revise Appendix C of the OI clarification as to where and when tritium samp discharges.	DCM (Table 4.	11-2) to add
3.2.2.6	CR 981490, ODCM Table 4.11-2 Note e, and R Procedures. CA-01, Revise Appendix C of the specify the proper tritium sample point.		
3.2.2.7	CR 982097, Liquid Discharge Post Release Rev Section 1 of the ODCM to add clarification for concentration when the Post Dose Correction Fa	calculation of r	•••
3.2.2.8	CR 990025, Unnecessary Radiation Monitor Se Discharges. No ODCM changes are required for		After Waste
3.2.2.9	CR 992652, Discrepancies Concerning ODCM Effluent Instrumentation. CA-02, Revise Apper proper reference to the HP Shift logs.		
3.2.2.10	CR 993021, Apparent Failure to Test RM-DA-1 ODCM. No ODCM changes are required for th	-	on as Required by
3.2.2.11	CR 001682, ODCM Action 28 Guidance. CA-(ODCM (Table 3.3-13, Action 28) to differentiat Inoperable Process Flow Rate Monitors vs. Sam	e actions assoc	iated with
3.2.2.12	CR02-05533, Procedure 1/2-ODC-3.03, ATTA CA-01, Revise ODCM procedure 1/2-ODC-3.0 minimum channels operable and associated acti Device [FR-1LW-103] is inoperable.	3 (Table 3.3-12) to include
3.2.2.13	CR02-05711, TS and ODCM changes not reflect Log. CA-01, Revise 1/2-ODC-3.03 to add a rec groups notification of pending ODCM changes.	uirement for a	

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	3.2.2.14	CR02-06174, Tracking of Activities for Unit 1 RCS 2 Implementation. CA-13, Revise ODCM procedure 1/ discussion as to why Zn-65 is being added to the ODC procedure 1/2-ODC-2.01 (Tables 1.1-1a and 1b) to in to ODCM liquid source term.	/2-ODC-1 CM. CA-	.01 to include a 14, Revise ODCM	
	3.2.2.15	CR 03-02466, RFA-Radiation Protection Effluent Co Recommendation on Processing when Performing We 7A/7B]. CA-02, Revise ODCM Procedure 1/2-ODC show the liquid waste flow path cross-connect betwee	eekly San •2.01, (At	ple of [1LW-TK- tachment D) to	
y	3.2.2.16	CR03-04830, Containment Vacuum Pump Replacement Term. CA-03, Revise Unit 1 Containment Vacuum P procedure 1/2-ODC-2.02, Attachment A, Table 2.1-1	ump Sou		
·	3.2.2.17	CR03-06123, Enhance Table 3.3-6 of 1/2-ODC-3.03 to Add More Preplanned Method of Monitoring. CA-01, Revise Table 3.3-6 and Table 4.3-3 to allow use of Eberline SPING Channel 5 as an additional 2 nd PMM when the Unit 1 Mid or High Range Noble Gas Effluent Monitors are Inoperable.			
	3.2.2.18	CR03-06281, Gaseous Tritium Sampling Required by ODCM (1/2-ODC-3.03) Unclear for Chemistry. CA-01, Revise procedure Attachment K Table 4.11-2 for RP & Chemistry sampling of Gaseous Effluent Pathways to show which effluent pathways need sampled for compliance to ODCM Control 3.11.2.1 requirements.			
÷.	3.2.2.19	CR03-07487, Results of NQA Assessment of the Rad CA-01, Revise Calculation Package No. ERS-ATL-9. "Surface Water Supply" per guidance presented in NU 05, Revise 1/2-ODC3.03 Control 3.11.1.4 to update the outside storage tanks.	5-007 to c UREG-08	clarify the term 00 SRP 15.7.3. CA-	
· · · · · ·	3.2.2.20		valuate pr	rocedure	
	3.2.2.21	CR03-09288, LAR 1A-321 & 2A-193, Increased Flexibility in Mode Restraints. CA-19, Review LAR 1A-321/2A-193 to identify the affected Rad Effluent procedures, programs, manuals, and applicable plant modification documents that will need to be revised to support implementing the LAR.			
	3.2.2.22	CR03-09959, RFA-Rad Protection Provide Clarification Tritium Sample. CA-01, Revise ODCM procedure 1/ (Table 4.11-2 note c & note e) to allow sampling of the atmosphere.	/2-ODC-3	.03 Attachment K	

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3.2.2.23	CR03-11726, Typographical Error Found in C ODCM procedure 1/2-ODC-3.03, Attachment typographical error. Specifically, the final wo "nad" to "and".	O, Control 3.11.	2.5 to correct a
3.2.2.24	CR04-00149, Radiation Protection Performan CA-12. Incorporate the Global Positioning Sy Environmental Monitoring Program.		
3.2.2.25	 CR04-01643, Procedure Correction – Typogra Revise ODCM procedure 1/2-ODC-3.03, Atta to correct a typographical error. Specifically, Gauge used for measurement of sample flow (Device) needs changed from [PI-1GW-13] to 	chment F, (Table the Asset Numbe from the Alterna	: 3.3-13 and 4.3-13) r for the Vacuum
3.2.2.26	CR04-02275, Discrepancies in Table 3.3-13 o ODCM procedure 1/2-ODC-3.03, Attachment clarification that the "Sampler Flow Rate Mor "Particulate and Iodine Sampling".	F, (Table 3.3-13	and 4.3-13) to add
3.2.2.27	CR05-01169, Chemistry Action Plan For Tran CA-14 thru CA-21, Revise ODCM procedures "Manager, Radiation Protection" to Manager I Chemistry".	s to change docur	nent owner from
3.2.2.28	CR05-01390, Include GPS data in 2004 REM 1/2-ENV procedures. CA-02, revise ODCM p an update of REMP sample locations (using the sample locations).	procedure 1/2-OE	C-2.03 to include
3.2.2.29	CR 05-03306, Incorporated Improved Technic	al Specifications	(ITS).
3.2.2.30	CR05-03854, ODCM Figure for Liquid Efflue CA-01, revise ODCM procedure 1/2-ODC-2.0 Attachment D, Figure 1.4-3 to incorporate a m No. 8700-RM-27F.	1 (ODCM: Liqui	d Effluents)
3.2.2.31	CR06-04908, Radiation Monitor Alarm Setpo ODCM procedure 1/2-ODC-2.01 to update the and [RM-1DA-100] for incorporation of the E Amendment No. 275. Also, CA-04; revised O add a" \leq " designation to all alarm setpoints for gas effluent monitors.	e alarm setpoints xtended Power U DCM procedure	of [RM-1RM-100] prate per Unit 1 TS 1/2-ODC-2.02 to
3.2.2.32	CR06-6476, Procedure 1/2-ODC-2.01 Needs I revise ODCM procedure 1/2-ODC-2.01 to upo RQ101] for incorporation of the Extended Pov Amendment No. 156.	late the alarm set	points of [2SWS-

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3.2.3.1	ERS-ATL-83-027; Liquid Waste Dose Factor Cal and Later	culation for H	IPM-RP 6.5, Issue 3	
3.2.3.2	ERS-SFL-85-031; Gaseous Effluent Monitor Effic	ciency Data		
3.2.3.3	ERS-ATL-86-008; ODCM Alarm Setpoint Revisi	ons for Gase	ous Monitors	
3.2.3.4	ERS-HHM-87-014; Unit 1/2 ODCM Gaseous Eff Determinations	luent Monito	r Alarm Setpoint	
3.2.3.5	ERS-ATL-87-026; BVPS-1 and BVPS-2 ODCM	T Factor Just	ification	
3.2.3.6	ERS-ATL-89-014; Verification/Validation of OD	CM R Values	5	
3.2.3.7	ERS-ATL-90-021; Justification for Removal of Te Flowrate Measurement Requirements for 2RMQ-1 2HVL-RQ112	-		
3.2.3.8	ERS-ATL-95-006; Re-evaluation of TS/ODCM SR's 4.11.1.1.3, 4.11.1.1.4 and Notes e and g of TS/ODCM Table 4.11-1			
3.2.3.9	ERS-ATL-95-007; Verification of Outside Storag TS 3.11.1.4	e Tank Activ	ity Limit of	
3.2.3.10	Stone and Webster UR(B)-160; BVPS Liquid Rac Concentrations - Expected and Design Cases (Per			
3.2.3.11	Vendor Calculation Package No. 8700-UR(B)-222 Containment Conversion, Power Uprate, and Alte Setpoints for the Radiation Monitors at Unit 1	Alternate Source Terms on the Alarm		
3.2.3.12	Engineering Change Package No. ECP-04-0440, I	Extended Pov	ver Uprate (Unit 1)	
3.2.3.13	Vendor Calculation Package No. 8700-UR(B)-508 Containment Conversion, Power Uprate, and Alte Setpoints for the Radiation Monitors at Unit 2	wer Uprate, and Alternate Source Terms on the Alarm		
3.2.3.14	Engineering Change Package No. ECP-04-0440, I	Extended Pov	ver Uprate (Unit 2)	
3.2.4 <u>Inte</u>	rnal Letters:			
3.2.4.1	DLC Response to NRC Unresolved Item 50-334/8 Study- Particle Distribution Evaluation, Novembe	-	liation Monitor	
	ND1SHP:776, BVPS-1 ODCM Table 2.2-2, Appe			

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3.2.4.3	ND3NSM:3431; Technical Specification Verification	n Effort, A	
3.2.4.4	NDLNSM:3522; Technical Specification Verificatio September 14, 1988	n Effort C	hecklist,
3.2.4.5	ND1NSM:3652; Technical Specification Verification	n Effort, N	lovember 21, 1988
3.2.4.6	NPD3SHP:2466; Self Assessment of the Liquid and BVPS - Final Report, July 16, 1997	Gaseous E	Effluent Processes at
3.2.4.7 -	NPD3SHP:2257; ODCM Liquid Waste Recirculation	n Rates, Fe	ebruary 11, 1998
3.2.4.8	NPD3SHP:2643; Action 28 of ODCM Appendix C 7	Table 3.3-1	13, January 14, 1999
3.2.4.9	ND3MNO:4309; Response to Request for Technical April 20, 1999.	Specificat	ion Interpretation,
3.2.5 <u>Con</u>	tractor Technical Evaluation Reports:		
3.2.5.1	EGG-PHY-8194; Technical Evaluation Report for th Updated through Issue 2, Revision 1, Beaver Valley 1 September 1988		
3.2.5.2	EGG-PHY-8217; Technical Evaluation Report for th updated through Issue 1, Revision 2, Beaver Valley F September 1988	ower Stat	
3.2.5.3	NUS-2173; Development of Terrain Adjustment Fac Valley Power Station for the Straight-Line Atmosphe June 1978		
3.2.5.4	UCRL-50564; Concentration Factors of Chemical El Organisms, Revision 1, 1972	ements in	Edible Aquatic
3.2.6 <u>NR</u>	<u>C Letters</u> :		
3.2.6.1	Unit 1 Technical Specification Amendment 66, Marc	h 28, 1983	3
3.2.6.2	Beaver Valley Unit 2 - Offsite Dose Calculation Man July 14, 1987	ual, ODC	M (TAC 63996),
3.2.6.3	Beaver Valley Units 1 and 2 - Acceptance of the Offs (TAC 93996 and 67421), March 2, 1989	ite Dose C	Calculation Manuals
3.2.6.4	Unit 1/2 Technical Specification 6.8.6, including Am (LAR 1A-175/2A-37), Implemented August 7, 1995	endments	1A-188/2A-70

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3.2.6.5	Unit 1/2 Technical Specification 6.8.6, including An (LAR's 1A-231/2A-101), Implemented December 1,				
3.2.6.6	Unit 1/2 Technical Specification Figure 5.1-2, including Amendments 1A-202/2A-83 (LAR 1A-234/2A-107, Implemented June 9, 1997				
3.2.6.7	Unit 1/2 Technical Specifications 6.9.1.10 and 6.9.2 Amendments 1A-220/2A-97 (LAR 1A-246/2A-116)	•			
3.2.6.8	Unit 1/2 Technical Specification 3.3.3.1, including A (LAR 1A-287/2A-159), Implemented April 11, 2002		nts 1A-246/2A-124		
3.2.6.9	Unit 1/2 Technical Specifications 3.11.1.4, 3.11.2.5, Amendments 1A-250/2A-130 (LAR 1A-291/2A-163) 2002		-		
3.2.7 <u>NUR</u>	<u>lEG's</u> :				
3.2.7.1	NUREG-0017, Calculation of Releases of Radioactive Materials in Gaseous and Liquid Effluents from Pressurized Water Reactors, (PWR- Gale Code), Revision 1, April 1985				
3.2.7.2	NUREG 0133; Preparation of Radiological Effluent Technical Specification for Nuclear Power Plants, October 1978				
3.2.7.3	NUREG-0172; Age-Specific Radiation Dose Comm Chronic Intake, November 1977	itment Fac	ctors for a One-Year		
3.2.7.4	NUREG-0324, XOQDOQ, Program for the Meteoro Releases at Nuclear Power Stations, September 1977	-	aluation of Routine		
3.2.7.5	NUREG-0472; Radiological Effluent Technical Spe	cifications	for PWR's.		
3.2.7.6	NUREG-0800, Standard Review Plan, Postulated Ra Liquid-Containing Tank Failures, July 1981	adioactive	Releases Due to		
3.2.7.7	NUREG-1301; Offsite Dose Calculation Manual Guidance: Standard Radiological Effluent Controls for Pressurized Water Reactors (Generic Letter 89-01, Supplement No. 1), April 1991				
3.2.7.8	NUREG-1431; Standard Technical Specification - W Specifications	Vestinghou	ise Plants		
3.2.7.9	NUREG/CR-2919; Meteorological Evaluation of Ro Nuclear Power Stations, September 1982	outine Efflu	uent Releases At		
3.2.8 <u>Reg</u> i	llatory Guides:				

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3.2.8	.1 RG-1.23; Meteorological Measurement Program	h For Nuclear F	ower Plants
3.2.8	.2 RG-1.109; Calculation of Annual Doses to Man Effluents for the Purpose of Evaluating Complia Appendix I, April 1977		
3.2.8	.3 RG-1.111; Methods For Estimating Atmospheric Gaseous Effluents In Routine Releases From Lig Revision 1, July 1977	•	-
3.2.8	.4 RG-1.113; Estimating Aquatic Dispersion of Eff Routine Reactor Releases For The Purpose of Im April 1977		
3.3 <u>Co</u>	nmitments	Ι.	
3.3.1	10 CFR Part 20, Standards for Protection Against Rad	iation	
3.3.2	10CFR20.1302, Compliance with Dose Limits for Ind	ividual Membe	ers of the Public.
3.3.3	10 CFR Part 50, Domestic Licensing of Production and	d Utilization F	acilities
3.3.4	10CFR50.36a, Technical Specifications on Effluents fi	rom Nuclear P	ower Reactors
3.3.5	Appendix I to 10 CFR Part 50, Numerical Guides For Conditions For Operation to Meet The Criterion "As L For Radioactive Material in Light-Water-Cooled Nucle	ow As Reason	ably Achievable"
3.3.6	40 CFR Part 141		
3.3.7	40 CFR Part 190, Environmental Radiation Protection Operations	Standards For	Nuclear Power
3.3.8	Licensee Response to NRC Unresolved Item 50-334/8 Particle Distribution Evaluation showed that the Licen correction factors to determine particulate activity in sa release pathways.	see must contin	nue to use
3.3.9	CR 05-03854, ODCM Figure for Liquid Effluent Release revise ODCM procedure 1/2-ODC-2.01 (ODCM: Liquid Figure 1.4-3 to incorporate a modified version of Plant	uid Effluents)	Attachment D,

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4.0 <u>RECORDS AND FORMS</u>

4.1 <u>Records</u>

- 4.1.1 Any calculation supporting ODCM changes shall be documented, as appropriate, by a retrievable document (eg; letter or calculation package) with an appropriate RTL number.
- 4.1.2 Changes to the ODCM shall be documented and records of reviews shall be retained in accordance with the applicable record retention provisions of the quality assurance program description included in the Updated Final Safety Analysis Report.

4.2 <u>Forms</u>

4.2.1 None

5.0 PRECAUTIONS AND LIMITATIONS

- 5.1 This OFFSITE DOSE CALCULATION MANUAL (ODCM) provides the information and methodologies to be used by Beaver Valley Power Station Unit 1 and Unit 2 (BV-1) and (BV-2) to assure compliance with the Administrative Controls Section of the operating Technical Specifications. They are intended to show compliance with 10 CFR 20.1302,^(3.2.1) 10 CFR 50.36a,^(3.2.2) Appendix I of 10 CFR Part 50,^(3.2.3) and 40 CFR Part 190.^(3.2.4)
- 5.2 This ODCM is based on the NUREG's and Generic Letter documents from the United States Nuclear Regulatory Commission.^(3.1.1, 3.1.2, 3.1.3, 3.1.4) Specific plant procedures for implementation of the ODCM are included in various site procedures and documents, and are utilized by the operating staff to assure compliance with Technical Specifications and the CONTROLS Procedure of the ODCM:^(3.1.5)
- 5.3 The ODCM has been prepared as generically as possible in order to minimize the need for future versions. However, some changes to the ODCM may be necessary in the future. Any such changes will be properly prepared, reviewed, and approved as indicated in the Administrative Control Section of the Technical Specifications. Additionally, changes to the ODCM require review and acceptance by the PORC.
 - 5.3.1 An implementation procedure for control of the ODCM is included in 1/2-ADM-1640.^(3.1.6)
- 5.4 This procedure also contains information that was previously contained in Appendix F of the previous BV-1 and 2 Offsite Dose Calculation Manual.
 - 5.4.1 In regards to this, the Tables that were transferred from Appendix F to the appropriate ATTACHMENTS of this procedure will still contain a prefix denoting an "F".

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5.5 This procedure includes Improved Technical Specifications (**[ITS]**) information that is NOT applicable to current Technical Specifications (**[CTS]**) and **[CTS]** information that is NOT applicable in **[ITS]**. The **[CTS]** information shall be used prior to the **[ITS]** effective date. The **[ITS]** information shall be used on or after the **[ITS]** effective date.

6.0 ACCEPTANCE CRITERIA

- 6.1 All changes to this procedure shall contain sufficient justification that the change will maintain the level of radioactive Effluent Control required by 10 CFR 20.1302, 40 CFR Part 190, 10 CFR 50.36a and Appendix I to 10 CFR 50, and not adversely impact the accuracy or reliability of effluent dose or alarm setpoint calculation.^(3.1.7)
 - 6.1.1 All changes to this procedure shall be prepared in accordance with 1/2-ADM-0100^(3.1.7) and 1/2-ADM-1640.^(3.1.6)
 - 6.1.2 All changes to this procedure shall be reviewed and approved in accordance with NOP-SS-3001 ^(3.1.8) and 1/2-ADM-1640. ^(3.1.6)

7.0 **PREREQUISITES**

7.1 The user of this procedure shall be familiar with ODCM structure and content.

8.0 **PROCEDURE**

8.1 Description of ODCM Structure

- 8.1.1 <u>1/2-ODC-1.01, ODCM: Index, Matrix and History of ODCM changes</u> (formerly: ODCM Index and Appendix F)
 - 8.1.1.1 History of ODCM Changes
 - 8.1.1.2 Summary of ODCM References
 - 8.1.1.3 List of Tables (ATTACHMENT A)
 - 8.1.1.4 List of Figures (ATTACHMENT B)
 - 8.1.1.5 Matrix of Procedures Used to Meet ODCM Controls (ATTACHMENT C)
 - 8.1.1.5.1 BV-1 Radiation Monitor Surveillances
 - 8.1.1.5.2 BV-1 Liquid Effluent Monitor Surveillances
 - 8.1.1.5.3 BV-2 Liquid Effluent Monitor Surveillances
 - 8.1.1.5.4 BV-1 Gaseous Effluent Monitor Surveillances
 - 8.1.1.5.5 BV-2 Gaseous Effluent Monitor Surveillances

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8.1.1.5.6	BV-1 and 2 Liquid Effluent Concentration S	Surveillances	
8.1.1.5.7	BV-1 and 2 Liquid Effluent Dose Surveillar	nces	
8.1.1.5.8	BV-1 and 2 Liquid Effluent Treatment Surv	eillances	
8.1.1.5.9	BV-1 and 2 Gaseous Effluent Air Dose Surv	veillances	:
8.1.1.5.10	BV-1 and 2 Gaseous Effluent Particulate an	d Iodine Surv	veillances
8.1.1.5.11	BV-1 and 2 Gaseous Effluent Treatment Su	rveillances	
8.1.1.5.12	BV-1 and 2 Gaseous Effluent Total Dose Su	urveillances	
8.1.1.5.13	BV-1 and 2 Gaseous Effluent REMP Survey	illances	
8.1.1.5.14	BV-1 and 2 Gaseous Effluent Land Use Cer	isus Surveilla	ances
8.1.1.5.15	BV-1 and 2 Gaseous Effluent Interlaborator Surveillances	y Compariso	n Program
	-2.01, ODCM: Liquid Effluents r; ODCM Sections 1 and 5)		
8.1.2.1 Ala	arm Setpoints		
8.1.2.1.1	BV-1 Setpoint Determination Based On A G	Conservative	Mix
8.1.2.1.2	BV-1 Setpoint Determination Based On An	alysis Prior T	o Release
8.1.2.1.3	BV-2 Setpoint Determination Based On A G	Conservative	Mix
8.1.2.1.4	BV-2 Setpoint Determination Based On An	alysis Prior T	o Release
8.1.2.2 Co	mpliance With 10 CFR 20 EC Limits		
8.1.2.2.1	Batch Releases		
8.1.2.2.2	Continuous Releases		
8.1.2.3 Co	mpliance With 10 CFR 50 Dose Limits		
8.1.2.3.1	Cumulation Of Doses		
8.1.2.3.2	Projection Of Doses		
8.1.2.4 Liq	uid Radwaste Treatment System		
8.1.2.4.1	BV-1 Liquid Radwaste Treatment System C	Components	

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8.1.2.4.2	BV-1 Laundry and Contaminated Shower Dra	in System (<u> </u>
8.1.2.4.3	BV-2 Liquid Radwaste Treatment System Cor	•	components
		nponents	
	e Boundary for Liquid Effluents		
8.1.2.5.1	Liquid Effluent Site Boundary		÷
	2-2.02, ODCM: Gaseous Effluents (; ODCM Sections 2 and 5)		
8.1.3.1 Al	arm Setpoints		
8.1.3.1.1	BV-1 Setpoint Determination Based On A Cal	culated Mi	x
8.1.3.1.2	BV-1 Setpoint Determination Based On Analy	vsis Prior T	o Release
8.1.3.1.3	BV-2 Setpoint Determination Based On A Cal	culated Mi	X
8.1.3.1.4	BV-2 Setpoint Determination Based On Analy	vsis Prior T	o Release
8.1.3.1.5	BV-1/2 Setpoint Determination Based On A C	alculated N	Лix
8.1.3.1.6	BV-1/2 Setpoint Determination Based On Ana	alysis Prior	To Release
8.1.3.2 Co	mpliance With 10 CFR 20 Dose Rate Limits		
8.1.3.2.1	Dose Rate Due To Noble Gases		
8.1.3.2.2	Dose Rate Due To Radioiodines And Particula	ates	
8.1.3.3 Co	mpliance With 10 CFR 50 Dose Limits	,	
8.1.3.3.1	Doses Due To Noble Gases		<u>.</u>
8.1.3.3.2	Doses Due To Radioiodines And Particulates		
8.1.3.4 Ga	seous Radwaste Treatment System	•	
8.1.3.4.1	BV-1 Gaseous Radwaste Treatment System C	omponents	
8.1.3.4.2	BV-2 Gaseous Radwaste Treatment System C	omponents	
8.1.3.5 Sit	e Boundary for Gaseous Effluents	t s zl	· ,
	2-2.03, ODCM: Radiological Environmental Mor (; ODCM Section 3)	nitoring Pro	ogram
	ogram Requirements		

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	-ODC-2.04, ODCM: Information Related to 40 CF rmerly; ODCM Section 4)	<u>R 190</u>	
8.1.5.1	Compliance with 40 CFR 190 Dose Limits		
8.1.5.2	Report Requirements		
8.1.5.3	Inside the Site Boundary Radiation Doses		
8.1.5.	3.1 Gaseous Effluent Site Boundary		
	-ODC-3.01, ODCM: Dispersion Calculational Proc rmerly; ODCM Appendix A & B)	edure and Sou	arce Term Inputs
8.1.6.1	Dispersion and Deposition Parameters		
8.1.6.2	BV-1 and 2 Release Conditions		
8.1.6.3	BV-1 Liquid Source Term Inputs		
8.1.6.4	BV-2 Liquid Source Term Inputs		
8.1.6.5	BV-1 Gaseous Source Term Inputs		
8.1.6.6	BV-2 Gaseous Source Term Inputs		
	-ODC-3.02, ODCM: Bases for ODCM Controls rmerly; ODCM Appendix D)		
8.1.7.1	Bases 3.3.3.1: Radiation Monitoring Instrumenta	ation	
8.1.7.2	Bases 3.3.3.9: Radioactive Liquid Effluent Mon	toring Instrum	entation
8.1.7.3	Bases 3.3.3.10: Radioactive Gaseous Monitoring	g Instrumentati	on
8.1.7.4	Bases 3.11.1.1: Liquid Effluent Concentration		
8.1.7.5	Bases 3.11.1.2: Liquid Effluent Dose		
8.1.7.6	Bases 3.11.1.3: Liquid Radwaste Treatment Syst	em	
8.1.7.7	Bases 3.11.1.4: Liquid Holdup Tanks		
8.1.7.8	Bases 3.11.2.1: Gaseous Effluent Dose Rate		
8.1.7.9	Bases 3.11.2.2: Dose- Noble Gases		
8.1.7.10	Bases 3.11.2.3: Dose - Radioiodines, Radioactiv and Radionuclides Other Than Noble Gases	e Material in F	Particulate Form,

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8.1.7.11	Bases 3.11.2.4: Gaseous Radwaste Treatment System	n ·	
8.1.7.12	Bases 3.11.2.5: Gas Storage Tanks		
8.1.7.13	Bases 3.11.4.1: Total Dose		
8.1.7.14	Bases 3.12.1: REMP Program Requirements		· · ·
8.1.7.15	Bases 3.12.2: REMP - Land Use Census		
8.1.7.16 -	Bases 3.12.3: REMP - Interlaboratory Comparison P	rogram	م. بر
	ODC-3.03, ODCM: Controls for RETS and REMP Promerly; ODCM Appendix C)	ograms	
8.1.8.1	Controls 3.0.1 thru 3.0.4: Applicability		
8.1.8.2	Controls 4.0.1 thru 4.0.4: Surveillance Requirements	}	
8.1.8.3	Control 3.3.3.1: Radiation Monitoring Instrumentation	on	
8.1.8.4	Control 3.3.3.9: Radioactive Liquid Effluent Monito	ring Instru	imentation
8.1.8.5	Control 3.3.3.10: Radioactive Gaseous Monitoring In	nstrumenta	ation
8.1.8.6	Control 3.11.1.1: Liquid Effluent Concentration		
8.1.8.7	Control 3.11.1.2: Liquid Effluent Dose		
8.1.8.8	Control 3.11.1.3: Liquid Radwaste Treatment System	n	·
8.1.8.9	Control 3.11.1.4: Liquid Holdup Tanks		
8.1.8.10	Control 3.11.2.1: Gaseous Effluent Dose Rate		
8.1.8.11	Control 3.11.2.2: Dose- Noble Gases		· · · · ·
8.1.8.12	Control 3.11.2.3: Dose - Radioiodines, Radioactive Mand Radionuclides Other Than Noble Gases	Material in	n Particulate Form,
8.1.8.13	Control 3.11.2.4: Gaseous Radwaste Treatment Syste	em	
8.1.8.14	Control 3.11.2.5: Gas Storage Tanks		
8.1.8.15	Control 3.11.4.1: Total Dose		,
8.1.8.16	Control 3.12.1: REMP Program Requirements		
8.1.8.17	Control 3.12.2: REMP - Land Use Census	·	

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8.1.8.18	Control 3.12.3: REMP - Interlaboratory Comp	arison Program	······································
8.1.8.19	Control 6.9.2: Annual REMP Report		
8.1.8.20	Control 6.9.3: Annual RETS Report		
8.2 <u>History Of</u>	ODCM Changes		
8.2.1 <u>Chang</u>	e (1) of BV-1 ODCM (Issue 1), Effective Janu	ary, 1984	
	This is the initial issue of the BV-1 ODCM, as Radiological Effluent Technical Specifications manual was commensurate with Amendment N Specifications as approved by the NRC on Man	(RETS). Impler No. 66 to the Unit	nentation of this
8.2.2 <u>Chang</u>	e (2) of BV-1 ODCM (Issue 1, Rev 1), Effecti	ve October, 1984	
8.2.2.1	A description of the changes implemented with	n this revision are	as follows:
8.2.2.1.1	Section 1.0: Table 1.3-1 was revised to in nuclides presently identified at BVPS and	-	
8.2.2.1.2	Section 2.0: Equations 2.1-19 and 2.1-22 Meeting No. BVPS-RSC-1-84 on Januar revised to clarify flow rate terminology.		* *
8.2.2.1.3	Section 2.0: Section 2.2.2 was revised to pathways for gaseous dose rate calculation radionuclides in particulate form with ha	ons of I-131, tritiu	um, and
8.2.2.1.4	<u>Section 2.0</u> : Table 2.2-13 was revised to the maximum organ. Also, the receptor and addition/deletion of nuclides to be co Specifications and nuclides identified at	was changed from onsistent with the	n infant to child,
8.2.3 <u>Chang</u>	e (3) of BV-1 ODCM (Issue 1, Rev 2); Effective	<u>ve July, 1986</u>	
	A description of the changes that were implement follows:	ented with this re	vision are as
8.2.3.1.1	Section 1.0: Provide a flow based monito Section 1.1.2. This change makes Sectio 1.1.1 and current procedures.		
8.2.3.1.2	Section 1.0 and 2.0: Revise the 31-day do methodology in Sections 1.3.2, 2.3.1.2, a the 31-day dose projection limits and cha methodology to be consistent with propo	and 2.3.2.2. This anged the dose pr	change corrected

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itle:		Unit:	/2-ODC-1.01 Level Of Use:
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8.2.3.1.3 8.2.4 Change	Section 2.0: Revise the Gaseous Effluent Moni and 2.1.2. They were revised due to pressure c detectors, changes in isotopic literature, and the 5 alternate monitor data. The calculations supp in Calculation Packages ERS-SFL-85-031 and (4) of BV-1 ODCM (Issue 2), and BV-2 ODCM (Issue 2).	orrections e addition coorting this ERS-ATL-	determined for the of SPING Channel item are contained 86-008.
<u>1987</u>	(4) of D^{-1} ODCIVI (15500 2), and D^{-2} ODCIVI (1.	<u>5540 1, 107</u>	<u>- 1), Encenve suly,</u>
rev	ith the start-up of BV-2 in the second half of 1987, vision and the BV-2 ODCM required initial implent e changes are as follows:		-
8.2.4.1.1	Produce functionally compatible BV-1 and BV dose rate limits and meet regulatory requirement scope of the revisions to the Unit 1 ODCM, it w Also, for clarity, the draft BV-2 ODCM previous was regarded as Issue 1 (historical) and operation 1, Revision 1 of the BV-2 ODCM.	nts. Note th vas re-issue usly submit	hat due to the ed as Issue 2. Ited to the NRC
8.2.4.1.2	Section 1.0: A shared liquid radwaste system, permitting mixing of waste for processing, the sharing of dilution water, and the apportionment of dose according to NUREG-0133 was incorporated into both ODCMs.		
8.2.4.1.3	Section 2.0: A shared <u>elevated</u> gaseous radwast mixing of gaseous radwaste and the apportionn NUREG-0133 was incorporated into both ODC	nent of dos	
8.2.4.1.4	Section 2.0: Separate ground level gaseous rele BV-1 ODCM was updated to incorporate the B base. Gaseous source terms were revised to tha BV-2 FSAR, and terms were added for calculat release.	V-2 five ye it calculate	ear meteorology d for BV-1 in the
8.2.4.1.5	Section 2.0: The gaseous effluent monitor alarm setpoints of both ODCMs were revised as required by revisions to meteorology, source terms, monitor efficiencies, and revised percentages of site dose rate limits.		
8.2.4.1.6	Section 2.0: Formal justification was provided described in the Containment Purge Dose Rate dose rate for a Containment Purge may be avera exceed 960 minutes. Since the Containment air is 60 minutes, then the maximum value for "T" minutes = 16).	calculation aged over a r volume cl	s. Whereas, the time period not to hange time period

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	(5) of BV-1 ODCM (Issue 2, Rev 1), and BV e December, 1987	-2 ODCM (Issu	e 1, Revision 2),
no titl	ction 2.0: Sections 2.1.3 and 2.1.4 of both Ol te concerning noble gas nuclides as requested ed Beaver Valley Unit 2 - Offsite Dose Calc 996).	by a NRC lette	er dated July 14, 1987
-	(6) of BV-1 ODCM (Issue 2, Rev 2), and BV e June, 1989	-2 ODCM (Issu	<u>e 1, Rev 3),</u>
8.2.6.1 A	description of the changes implemented with	this revision ar	e as follows:
8.2.6.1.1	Section 1.0 and 2.0: Both ODCMs were r and 2.4. This addition gives a description the Liquid Radwaste System and the Gase justification 1)	of and include	s flow diagrams of
8.2.6.1.2	<u>Section 1.0</u> : Corrected typos to BV-1 OD differentiation between the two f's, and ac Justification 1)	•	
8.2.6.1.3	Section 1.0: Re-define F_k in equation 1.3- the NRC. (See Justification 1)	1 of both ODC	Ms, as allowed by
8.2.6.1.4	Section 1.0 and 2.0: Typos were corrected ODCM equation 1.3-7; add a division sig ODCM equation 1.3-8; add a division sig Equation 2.1-20 of both ODCMs; change 0.70 to 0.33. (4) Equation 2.1-24 of both HSP multiplier from 0.70 to 0.33. (See J	n between the b n between the b the HHSP to H n ODCMs, chan	prackets. (2) BV-1 prackets. (3) SP multiplier from
8.2.6.1.5	Section 1.0 and 2.0: Typos were also corr words "from each reactor unit" to five pla 2.3.1.2, and 2.3.2.2) of both ODCMs. The current requirements of the Technical Spe punctuation in Section 2.3.2.1 of the BV- Table 3.0-1 of both ODCMs. (4) Correct ODCMs.	ices (Sections 1. is ensures comp cifications. (2) 1 ODCM. (3)	3.1, 1.3.2, 2.3.1.1, bliance with the Correct Correct typos in
8.2.6.1.6	Section 2.0: Add a Reference to Section 2 Justification 3)	2 of the BV-1 O	DCM. (See
8.2.6.1.7	<u>Section 2.0</u> : Add the words "from the site This ensures compliance with the current Specifications. (See Justification 2)		

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8.2.6.1.8	Section 2.0: Revise BV-1 ODCM Table 2 iodine radionuclide mix for the Unit 1 Ver for Xe-135m in the Containment Vacuum	ntilation Vent a	ind to correct a typo
8.2.6.1.9	Section 2.0: Provide re-verified $P_{i\tau}$ values 2.2-13 of both ODCMs. (See Justification		Valley site in Table
8.2.6.1.10	<u>Section 2.0</u> : Correct the definition for the in Section 2.3.2.1 of both ODCMs. (See J	▲	ow-meat pathway
8.2.6.1.11	Section 2.0: Provide re-verified R values f 2.3-2 through 2.3-20 of both ODCMs. (Se		-
8.2.6.1.12	<u>Appendix B</u> : Change the particulate and ic B of the BV-1 ODCM. (See Justification		actions in Appendix
8.2.6.2 The	e justification used for Change (6) to the ODO	CMs are as follo	ows:
8.2.6.2.1	A letter dated March 2, 1989 (from the NF Light regarding acceptance of the Offsite I NRC acceptance of the BV-1 and BV-2 O	Dose Calculation DCMs was base	on Manuals. The ed on Technical
	Evaluation Reports (TER No. EGG-PHY- provided by the Idaho National Engineerir As stated in the letter, minor concerns are	ng Laboratory.	
	In general, these concerns are considered t impact any of the calculations currently be contributions. However, one of these conc reproduce the ODCM R values for the cov pathways when using the ODCM/NUREG	ypos or additio ing performed cerns is regardin v-meat, cow-mi -0133 methodo	ns and in one way for dose ng the inability to ilk and goat-milk blogy. These R values
• . • •	(along with all other ODCM R values) we Package No. ERS-ATL-89-014. The result values for the three aforementioned pathwe values in error do not involve the controlling the controlling receptor is VIA the Inhalation pathways, not the pathways subject to error adversely impact the accuracy or reliability	Its of this packa ays were in error ng receptor for on, Ground, an r), <u>THEN</u> the c	age showed that the R or. <u>SINCE</u> the R gaseous release (i.e.; ad Vegetation hanges will not
8.2.6.2.2	As requested by DLC letters ND3NSM:34 ND1NSM:3652, Technical Specifications plant implementing procedures. As part of were identified in various sections of the C anomalies identified during the verification	were required t f this effort, wo DCM. This re	to be verified in all ording errors/typos

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8.2.6.2.3	As delineated in l	etter ND1SHP:776	, dated February 12,	, 1988 (BVPS-1
			series of apparent di	
		•••	-2 and similar table	-
	FSAR. Evaluation	n showed that appa	rent credit was give	n for continuous
	filtration of SLCR	S releases which is	s invalid at Unit 1.	However, the
	calculation package	ge on which the BV	PS-2 FSAR expect	ed release tables are
	based, is correct (i	.e.; no credit was t	aken for routine filt	ration for Unit 1
	releases). Except	for revising the OI	OCM, no further cor	rective action is
	necessary because	the particulates an	d iodines in the OD	CM were not used
- · · ·		· •	Therefore, this chan	•
	adversely impact	he accuracy or reli	ability of setpoint ca	alculations.
8.2.7 <u>Change (</u>	7) of BV-1 and 2 OD	CM (Issue 3), Effe	ctive August, 1995	
0071 ŤL			na shekare	
8.2.7.1 Th	e combined ODCM c	ontains the followi	ng changes.	
8.2.7.1.1	Prior to ISSUE 3	BV-1 and BV-2 ha	d individual ODCN	Is that were
				ting documents, the
			merger of the indivi	-
			uent control require	
			-	ix I to 10 CFR Part
	•	•	• •	racy or reliability of
	effluent, dose, or s	setpoint calculation	S.	
0 7 7 1 7		-		haw aameliana.
8.2.7.1.2	Section 1.0: Revi	sed Section 1.0 (Li	quid Effluents) to s	-
8.2.7.1.2	Section 1.0: Revi with 10 CFR 20 A	sed Section 1.0 (Li ppendix B (20.100	quid Effluents) to s 1 - 20.2401), Table	2, Col. 2 EC's. This
8.2.7.1.2	Section 1.0: Revi with 10 CFR 20 A includes the follow	sed Section 1.0 (Li ppendix B (20.100 ving: (1) Revising	quid Effluents) to s 11 - 20.2401), Table 3 the alarm setpoints	2, Col. 2 EC's. This s for monitors [RM-
8.2.7.1.2	Section 1.0: Revi with 10 CFR 20 A includes the follow 1LW-104, RM-11	sed Section 1.0 (Li ppendix B (20.100 ving: (1) Revising W-116, and 2SGC	quid Effluents) to s 1 - 20.2401), Table the alarm setpoints -RQ100]. (2) Upd	2, Col. 2 EC's. This s for monitors [RM- ating the BV-1
8.2.7.1.2	Section 1.0: Revi with 10 CFR 20 A includes the follow 1LW-104, RM-1L monitor detection	sed Section 1.0 (Li ppendix B (20.100 ving: (1) Revising W-116, and 2SGC efficiencies. (3) U	quid Effluents) to si 1 - 20.2401), Table 3 the alarm setpoints -RQ100]. (2) Upd Updating discharge	2, Col. 2 EC's. This s for monitors [RM- ating the BV-1 rate and dilution rate
8.2.7.1.2	Section 1.0: Revi with 10 CFR 20 A includes the follow 1LW-104, RM-1L monitor detection parameters for BV	sed Section 1.0 (Li ppendix B (20.100 ving: (1) Revising W-116, and 2SGC efficiencies. (3) U '-1 and BV-2. (4)	quid Effluents) to sl 1 - 20.2401), Table the alarm setpoints -RQ100]. (2) Upd Jpdating discharge f Adding the alarm s	2, Col. 2 EC's. This s for monitors [RM- ating the BV-1 rate and dilution rate etpoints for monitors
8.2.7.1.2	Section 1.0: Revi with 10 CFR 20 A includes the follow 1LW-104, RM-1L monitor detection parameters for BV	sed Section 1.0 (Li ppendix B (20.100 ving: (1) Revising W-116, and 2SGC efficiencies. (3) U '-1 and BV-2. (4)	quid Effluents) to si 1 - 20.2401), Table 3 the alarm setpoints -RQ100]. (2) Upd Updating discharge	2, Col. 2 EC's. This s for monitors [RM- ating the BV-1 rate and dilution rate etpoints for monitors
8.2.7.1.2	Section 1.0: Revi with 10 CFR 20 A includes the follow 1LW-104, RM-1L monitor detection parameters for BV	sed Section 1.0 (Li ppendix B (20.100 ving: (1) Revising W-116, and 2SGC efficiencies. (3) U '-1 and BV-2. (4)	quid Effluents) to sl 1 - 20.2401), Table the alarm setpoints -RQ100]. (2) Upd Jpdating discharge f Adding the alarm s	2, Col. 2 EC's. This s for monitors [RM- ating the BV-1 rate and dilution rate etpoints for monitors
8.2.7.1.2	Section 1.0: Revi with 10 CFR 20 A includes the follow 1LW-104, RM-1L monitor detection parameters for BV	sed Section 1.0 (Li ppendix B (20.100 ving: (1) Revising W-116, and 2SGC efficiencies. (3) U '-1 and BV-2. (4)	quid Effluents) to sl 1 - 20.2401), Table the alarm setpoints -RQ100]. (2) Upd Jpdating discharge f Adding the alarm s	2, Col. 2 EC's. This s for monitors [RM- ating the BV-1 rate and dilution rate etpoints for monitors
8.2.7.1.2	Section 1.0: Revi with 10 CFR 20 A includes the follow 1LW-104, RM-1L monitor detection parameters for BV	sed Section 1.0 (Li ppendix B (20.100 ving: (1) Revising W-116, and 2SGC efficiencies. (3) U '-1 and BV-2. (4)	quid Effluents) to sl 1 - 20.2401), Table the alarm setpoints -RQ100]. (2) Upd Jpdating discharge f Adding the alarm s	2, Col. 2 EC's. This s for monitors [RM- ating the BV-1 rate and dilution rate etpoints for monitors
8.2.7.1.2	Section 1.0: Revi with 10 CFR 20 A includes the follow 1LW-104, RM-1L monitor detection parameters for BV	sed Section 1.0 (Li ppendix B (20.100 ving: (1) Revising W-116, and 2SGC efficiencies. (3) U '-1 and BV-2. (4)	quid Effluents) to sl 1 - 20.2401), Table the alarm setpoints -RQ100]. (2) Upd Jpdating discharge f Adding the alarm s	2, Col. 2 EC's. This s for monitors [RM- ating the BV-1 rate and dilution rate etpoints for monitors
8.2.7.1.2	Section 1.0: Revi with 10 CFR 20 A includes the follow 1LW-104, RM-1L monitor detection parameters for BV	sed Section 1.0 (Li ppendix B (20.100 ving: (1) Revising W-116, and 2SGC efficiencies. (3) U '-1 and BV-2. (4)	quid Effluents) to sl 1 - 20.2401), Table the alarm setpoints -RQ100]. (2) Upd Jpdating discharge f Adding the alarm s	2, Col. 2 EC's. This s for monitors [RM- ating the BV-1 rate and dilution rate etpoints for monitors
8.2.7.1.2	Section 1.0: Revi with 10 CFR 20 A includes the follow 1LW-104, RM-1L monitor detection parameters for BV	sed Section 1.0 (Li ppendix B (20.100 ving: (1) Revising W-116, and 2SGC efficiencies. (3) U '-1 and BV-2. (4)	quid Effluents) to sl 1 - 20.2401), Table the alarm setpoints -RQ100]. (2) Upd Jpdating discharge f Adding the alarm s	2, Col. 2 EC's. This s for monitors [RM- ating the BV-1 rate and dilution rate etpoints for monitors
8.2.7.1.2	Section 1.0: Revi with 10 CFR 20 A includes the follow 1LW-104, RM-1L monitor detection parameters for BV	sed Section 1.0 (Li ppendix B (20.100 ving: (1) Revising W-116, and 2SGC efficiencies. (3) U '-1 and BV-2. (4)	quid Effluents) to sl 1 - 20.2401), Table the alarm setpoints -RQ100]. (2) Upd Jpdating discharge f Adding the alarm s	2, Col. 2 EC's. This s for monitors [RM- ating the BV-1 rate and dilution rate etpoints for monitors
8.2.7.1.2	Section 1.0: Revi with 10 CFR 20 A includes the follow 1LW-104, RM-1L monitor detection parameters for BV	sed Section 1.0 (Li ppendix B (20.100 ving: (1) Revising W-116, and 2SGC efficiencies. (3) U '-1 and BV-2. (4)	quid Effluents) to sl 1 - 20.2401), Table the alarm setpoints -RQ100]. (2) Upd Jpdating discharge f Adding the alarm s	2, Col. 2 EC's. This s for monitors [RM- ating the BV-1 rate and dilution rate etpoints for monitors
8.2.7.1.2	Section 1.0: Revi with 10 CFR 20 A includes the follow 1LW-104, RM-1L monitor detection parameters for BV	sed Section 1.0 (Li ppendix B (20.100 ving: (1) Revising W-116, and 2SGC efficiencies. (3) U '-1 and BV-2. (4)	quid Effluents) to sl 1 - 20.2401), Table the alarm setpoints -RQ100]. (2) Upd Jpdating discharge f Adding the alarm s	2, Col. 2 EC's. This s for monitors [RM- ating the BV-1 rate and dilution rate etpoints for monitors
8.2.7.1.2	Section 1.0: Revi with 10 CFR 20 A includes the follow 1LW-104, RM-1L monitor detection parameters for BV	sed Section 1.0 (Li ppendix B (20.100 ving: (1) Revising W-116, and 2SGC efficiencies. (3) U '-1 and BV-2. (4)	quid Effluents) to sl 1 - 20.2401), Table the alarm setpoints -RQ100]. (2) Upd Jpdating discharge f Adding the alarm s	2, Col. 2 EC's. This s for monitors [RM- ating the BV-1 rate and dilution rate etpoints for monitors
8.2.7.1.2	Section 1.0: Revi with 10 CFR 20 A includes the follow 1LW-104, RM-1L monitor detection parameters for BV	sed Section 1.0 (Li ppendix B (20.100 ving: (1) Revising W-116, and 2SGC efficiencies. (3) U '-1 and BV-2. (4)	quid Effluents) to sl 1 - 20.2401), Table the alarm setpoints -RQ100]. (2) Upd Jpdating discharge f Adding the alarm s	2, Col. 2 EC's. This s for monitors [RM- ating the BV-1 rate and dilution rate etpoints for monitors

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	8.2.7.1.3	Section 1.0: Revised Section 1.0 (Liquid Eff (Gaseous Effluents) to merge the BV-1 alarm BV-2 alarm setpoint calculations. For all prac- Figures, and Equations were transferred to the numbering was kept generically equal. The tw follows: (1) If a table was contained in both specific to BV-1 or BV-2, then an a or b was a example, Table 1.1-1 was previously included BV-2 ODCM. These tables are now numbere BV-1 and BV-2 respectively. A cross referen provided in the Table Of Contents. (2) If an ODCMs, but each had data specific to BV-1 or added to the equation. For example, Equation in the BV-1 ODCM and the BV-2 ODCM. T	setpoint cal ctical purpose e combined wo exception ODCMs, but added to the l in the BV- ed 1.1-1a and ce for ODC equation wa or BV-2, the n 1.1-1 was p hese equation	culations with the ses, when Tables, ODCM, the ns to this are as at each had data table. For 1 ODCM and the d 1.1-1b denoting M tables is s contained in both n a (1) or (2) was previously included ons are now
	8.2.7.1.4	numbered 1.1(1)-1 and 1.1(2)-1, denoting BV cross reference for ODCM equations is provid <u>Section 3.0</u> : Revised Section 3.0 (Radiologic Program) to list the program requirements fro Branch Technical Position (Revision 1, 1979)	led in the Ta al Environm m the Radio	able Of Contents.
·	8.2.7.1.5	<u>Section 4.0</u> : Revised Section 4.0 (Information provide clarified reporting requirements for the clarifications were taken from Generic Letter (NUREG-1301).	n Related To le Special R	eport. The
: •	8.2.7.1.6	<u>Appendix A</u> : Revised Appendix A to transfer parameters from Appendix A (Tables A-2 thro (Tables 2.3-35 through 2.3-38). This revision For example, all dispersion parameters are no ODCM.	ough A-5) to was done fo	o Section 2.3 or clarification.
	8.2.7.1.7	Appendix C: This is a new Appendix to the C the Radiological Effluent Technical Specificat from the Technical Specifications to Appendix Letter 89-01 and Generic Letter 89-01, Supple This Appendix also includes selected Definition the Technical Specifications (Section 1) and s Surveillance Requirement statements as deline Specifications (Section 3/4). These were added purposes, even though they are currently description.	tions (RETS x C of the O ement No. 1 ons and Tab elected App eated in the ed to Append	b) were transferred DCM per Generic (NUREG 1301). Hes as delineated in licability and Technical dix C for reference
	8.2.7.1.8	<u>Appendix D</u> : This is a new Appendix to the C Controls were transferred from the Bases Sect Specifications to Appendix D of the ODCM p	ion of the T	echnical

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8.2.7.1.9	<u>Appendix E</u> : This is a new Appendix to the Radioactive Effluent Release Report and the Environmental Report reporting requirement the ODCM.	e Annual Rad	e Annual liological	
8.2.7.1.10	There are three differences (i.e., non-editori revision when compared to the previous BV Specifications. These are the only changes bars. These differences are as follows:	-1 and BV-2	Technical	
8.2.7.1.10).1 First Difference - LLD Definition Cla	rification is d	escribed as follows:	
	 (1) There was a sentence removed in Definitions delineated in Appendix C sentence stated: "In calculating the Liby gamma ray spectrometry, the backg contributions of other radionuclides n (e.g., potassium in milk samples)." (2 justification of NUREG-0472, Rev. 2 removed the sentence from Tables 4.1 there are <u>no</u> other radionuclides normal However, there is applicability to envite to the existence of other radionuclides sentence, therefore, will not be remove 1. (3) Removal of the sentence from 4.11-2 does not adversely impact the a or past effluent LLD calculations. The radioactive effluent control required be 190, 10 CFR 50.36a, and Appendix I adversely impact the accuracy or relia setpoint calculations. (4) This change Tables 4.11-1 and 4.11-2 in generic age (i.e., NUREG-0472) and industry standards. 	the LLD Star Tables 4.11- LD for a radio ground shall i ormally prese) This senten (i.e., this revi 1-1 and 4.11- ally present ir fronmental LI in environm ed from Appe Appendix C, accuracy or re- is change mai y 10 CFR 20 to 10 CFR Pa bility of efflu e brings ODC greement with	hdard Deviation 1 and 4.11-2. This conuclide determined include the typical ent in the samples are was removed by ision to the NUREG -2). At BV-1 and 2, h effluent samples. LD calculations due ental samples. This endix C, Table 4.12- Tables 4.11-1 and eliability of current intains the level of .1302, 40 CFR Part art 50, and does not ent, dose, or CM Appendix C,	
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8.2.7.1.10.2 Second Difference - Change From Semi-Annual Report To Annual Report as follows: (1) The frequency of the Radioactive Effluent Release Report was changed from Semi-Annual to Annual. This change is justified by Federal Register, Rules And Regulations (Vol. 57, No. 169, Monday, August 31, 1992), where as: 10 CFR Part 50.36a(a)(2) states, in part. "Each licensee shall submit a report to the Commission annually that specifies the quantity of each of the principal radionuclides released to unrestricted areas in liquid and in gaseous effluents during the previous 12 months of operation...the time between submission of the reports must be no longer than 12 months..." (2) This change maintains the level of radioactive effluent control required by 10 CFR 20.1302, 40 CFR Part 190, 10 CFR 50.36a, and Appendix I to 10 CFR Part 50, and does not adversely impact the accuracy or reliability of effluent, dose, or setpoint calculations.

8.2.7.1.10.3 Third Difference - Implementation Of New 10 CFR 20 is described as follows: (1) The definition for MEMBER(S) OF THE PUBLIC was revised to agree with the definition in 10 CFR 20.1003. (2) The definition for UNRESTRICTED AREA was modified from the definition that was in the Technical Specifications prior to transferring to the ODCM. This modification was necessary to ensure that the ODCM dose model for gaseous releases is not affected. The modification involved adding the following sentence: "For gaseous release dose calculations, the UNRESTRICTED AREA should exclude any public road, railway, or waterway adjacent to or crossing the site that is not occupied continuously by MEMBER(S) OF THE PUBLIC". (3) The limits for liquid effluent concentration were changed from 1 times 10 CFR 20 Appendix B (20.1 - 20.601), Table II, Col. 2 MPC's to 10 times 10 CFR 20 Appendix B (20.1001 -20.2401), Table 2, Col. 2 EC's. This limit will now be referred to as the ODCM Effluent Concentration Limit (OEC). (4) For gaseous effluents, no changes were made to implement the New 10 CFR 20. As justification, when the utility adopted the RETS (1/1/84), compliance to 10 CFR 20 shifted from the MPC concept to the Unrestricted Area Dose Rate concept. The Dose Rate concept is the preferred method of controlling gaseous effluent release rate, and will continue to be used in-lieu of the MPC or EC concept. (5) Changing to the OEC limit for liquid effluents accommodates needed operational flexibility to facilitate implementation of the New 10 CFR 20 requirements. (6) For information, the general intent of the New Part 20 is that radiation doses to members of the public not exceed 100 mrems per year, which is more restrictive than the 500 mrems per year limit in the Old Part 20, and that fuel cycle licensees also comply with 40 CFR 190. The New Part 20 does not include a requirement on

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limiting radioactivity concentrations in effluents, which is less restrictive than the Old Part 20. (7) The basic requirements for RETS (i.e.; ODCM Appendix C Controls) are stated in 10 CFR 50.36a. These requirements indicate that compliance with the RETS will keep average annual releases of radioactive material in effluents to small percentages of the limits specified in the 10 CFR 20.106 (10 CFR 20.1302). These requirements also indicate that operational flexibility is allowed (with considerations for public health and safety) which may temporarily result in releases higher than such small percentages, but still within the MPC limits specified in the 10 CFR 20.106. The MPC's relate to an annual dose of 500 mrem. Also, 10 CFR 50.36a indicates that when using operational flexibility, best efforts shall be exerted to keep levels of radioactive materials in effluents to ALARA as set forth in 10 CFR 50 Appendix I. (8) As stated in the Introduction to Appendix B of the New 10 CFR 20, the liquid EC's are based on an annual dose of 50 mrem. Since a release concentration corresponding to a limiting dose rate of 500 mrem/year has been acceptable as a RETS limit for liquid effluents, it should not be necessary to reduce this limit by a factor of ten. (9) BV-1 and BV-2 has demonstrated that the use of the MPC's associated with the 10 CFR 20,106 has resulted in calculated maximum individual doses to a member of the public that are small percentages of the limits of 10 CFR 50 Appendix I. Therefore, the use of the OEC's, which correspond to an annual dose of 500 mrem (i.e.; 10 times the 10 CFR 20 EC's) should not have a negative impact on the ability to continue to operate within the limits of 10 CFR 50 Appendix I, and 40 CFR 190. (10) Operational flexibility is also necessary in establishing a basis for effluent monitor setpoint calculations. As previously discussed, the EC's stated in 10 CFR 20 relate to a dose of 50 mrem in a year. This is too restrictive to base effluent monitor setpoint calculations. For many liquid effluent release situations, the monitor background is high, which could result in a monitor setpoint that is approximately equal to the monitor background. (11) In summary, to accommodate operational flexibility needed for effluent releases, the limits associated with the liquid release concentration (i.e.; the OEC) are based on 10 times the EC's stated in the 10 CFR 20. The multiplier of 10 is used because the annual dose of 500 mrem (10 CFR 20 MPC bases) is a factor of 10 higher than the annual dose of 50 mrem (10 CFR 20 EC bases). Compliance with the 100 mrem dose limit of the 10 CFR 20.1302 will be demonstrated by operating within the dose limits of 10 CFR 50 Appendix I, and 40 CFR 190 (which are also ODCM Controls for liquid and gaseous effluents). Implementation of the 10 CFR 20 for liquid effluents maintains the level of radioactive effluent control required by 10 CFR 20.1302, 40 CFR Part 190, 10 CFR 50.36a, and Appendix I to 10 CFR Part 50, and does not

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	adversely impact the accuracy or reliabil setpoint calculations.	ity of efflu	ent, dose, or
fulf imp radi for of t	ummary, Per Generic Letter 89-01, the transfer of ills the goal of the USNRC Policy Statement for provements. It is not the USNRC's (or DLC's) int ioactive effluent control. Rather, the intent is to p RETS (as delineated in Technical Specification of the procedural details of the RETS to the ODCM.	Technical ent to redu provide pro 5.8.6) and a	Specification ace the level of ogrammatic controls allow for relocation
8.2.8 <u>Change (8</u>	8) of BV-1 and 2 ODCM (Issue 3, Rev 1), Effecti	ve Octobe	<u>r, 1995</u>
8.2.8.1 A d	escription of the changes implemented with this	revision ar	e as follows:
8.2.8.1.1	Index: Editorial changes were made for clarity	v. (See jus	tification 1)
8.2.8.1.2	Section 1.0: Revised Nb-95 and Nb-97 dose factor.	•	
8.2.8.1.3	<u>Appendix A</u> : A change was made to Table 1.1 proceed the table number. (See justification 1)		e letter A would
8.2.8.1.4	<u>Appendix B</u> : A descriptive paragraph was added Appendix. Also, changes were made to the tale proceed the table numbers. (See justification 1	oles so that	
8.2.8.1.5	Appendix C: Descriptive paragraphs were add (See justification 1). Removed the process flow surveillance requirements for gaseous effluent RQ301, 2RMQ-RQ303 and 2HVL-RQ112] from (See justification 3). Added alternate system end devices for the three gaseous effluent pathways (See justification 4). Revised Surveillance Rest 4.11.1.1.4 and notes e and g of Table 4.11-1 to sump sampling requirements (See justification	w rate oper radiation r om Tables ffluent flo s to Tables quirements clarify Tu	rability and nonitors [2RMQ- 3.3-13 and 4.3-13 w rate measuring 3.3-13 and 4.3-13 s 4.11.1.1.3 and
8.2.8.1.6	<u>Appendix D</u> : Descriptive paragraphs were add Appendix. (See justification 1)	ed at the fr	ont of the
8.2.8.1.7	<u>Appendix E</u> : Descriptive paragraphs were adde Appendix. (See justification 1)	ed at the fr	ont of the
8.2.8.1.8	<u>Appendix F</u> : This is a new Appendix to the OI procedure references for Radiological Effluent (RETS) that were transferred from the Technic Matrix. (See justification 1)	Technical	Specification

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8.2.8.2 The justification used for change (8) to the ODCM are as follows:

8.2.8.2.1 These changes are considered editorial in nature. Therefore, these editorial changes will maintain the level of radioactive effluent control required by 10 CFR 20.1302, 40 CFR Part 190, 10 CFR 50.36a, and Appendix I to 10 CFR 50. Also the editorial changes will not adversely impact the accuracy or reliability of effluent dose or setpoint calculation.

8.2.8.2.2

This change resulted from revising the bioaccumulation factor (BF) for niobium from the value posted in Table A-1 of Regulatory Guide 1.109, Revision 1, 1977 (30,000 pCi/kg per pCi/l). Since this change in niobium BF (as documented and justified in Appendix A to Calculation Package No. ERS-ATL-83-027) merely removes the conservatism associated with organism uptake, then the change will maintain the level of radioactive effluent control required by 10 CFR 20.1302, 40 CFR Part 190, 10 CFR 50.36a, and Appendix I to 10 CFR 50. Also, removing the conservatism will not adversely impact the accuracy or reliability of effluent dose or setpoint calculation.

8.2.8.2.3

This change removes the process flow rate operability and surveillance requirements for BV-2 Gaseous Effluent Radiation Monitors [2RMQ-RQ301, 2RMQ-RQ303 and 2HVL-RQ112] from Appendix C Tables 3.3-13 and 4.3-13. These items were removed from the ODCM by justification provided in Calculation Package No. ERS-ATL-90-021. A safety analysis and a no significant hazards evaluation were prepared and approved prior to submitted it to the NRC via TSCR No. 2A-61 in 1992. However, it was withdrawn in 1993 in an effort to alleviate any further delays associated with approval of TSCR No. 1A-175/2A-37 (Generic Letter 89-01 implementation). Removal of these requirements from the ODCM will maintain the level of radioactive effluent control required by 10 CFR 20.1302, 40 CFR Part 190, 10 CFR 50.36a and Appendix I to 10 CFR 50. Also removal of these items will not adversely impact the accuracy or reliability of effluent dose or setpoint calculation. The following is a summary of the justification. (1) BVPS-1 and BVPS-2 is currently using, and will continue to use design (maximum) system flow rates in ODCM Dose & Dose Rate Calculations, rather than those flow rates observed during. normal plant operation. (2) BVPS-2 UFSAR Section 11.3.3 indicates that the source term for these three pathways are not significant. These pathways are not included in UFSAR Tables 11.3-1 through 11.3-4 that list the expected and design releases for each potentially radioactive pathway. (3) The DLC commitment to Regulatory Guide 1.97, Rev. 2 (Section 1.8-1 of the BVPS-2 UFSAR) is not affected. This RG applies to instrumentation used during and after postulated accident conditions. These three process flow rate instruments were not used in any accident analysis, nor are they used to assess plant conditions during and following an accident. (4) The DLC commitment to Regulatory Guide 1.21, Rev. 1 (Section 1.8-1 of the

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BVPS-2 UFSAR) is not affected. RG 1.21, Section C.2 (Location of Monitoring) states in part: "All major and potentially significant paths for release of radioactive material during normal reactor operation, including anticipated operational occurrences, should be monitored. Measurements of effluent volume, rates of release, and specific radionuclides should be made insofar as practical.." As previously stated, the three process flow rate instruments are located on effluent pathways that do not have a significant source term. (5) BVPS-2 UFSAR Sections 9.4.13 and 9.4.16 indicate that the building ventilation system for these three pathways are non-safety related and are not required to perform any safety-related function. (6) There is no effect to the Noble Gas Monitors located on these three pathways. The Noble Gas Monitors are still capable of performing their intended functions as described in BVPS-2 UFSAR Section 11.5.2.4.

8.2.8.2.4 This change adds alternate system effluent flowrate measuring devices for the three BV-1 gaseous effluent pathways to Appendix C Tables 3.3-13 and 4.3-13. A 10 CFR 50.59 safety evaluation has concluded that no unreviewed safety question is involved by adding the alternate measuring devices to Appendix C Tables 3.3-13 and 4.3-13. This conclusion is based on the following: (1) There is no increase in the probability or consequences of accidents or malfunctions of equipment important to safety. (2) There is no creation of a possibility for an accident or malfunction of a different type than any evaluated previously. (3) There is no reduction in the margin of safety. (4) Also, since this change merely adds alternate measuring devices that meet the same surveillance requirements of the primary channel, then the change will maintain the level of radioactive effluent control required by 10 CFR 20.1302, 40 CFR Part 190, 10 CFR 50.36a, and Appendix I to 10 CFR 50. Also, addition of the alternate flow rate measuring devices will not adversely impact the accuracy or reliability of effluent dose or setpoint calculations.

8.2.8.2.5

This change to the ODCM clarifies Turbine Building sump sampling requirements and clarifies effluent related actions associated with detection of radioactivity in the secondary system. These clarifications are documented and justified in Calculation Package No. ERS-ATL-95-006. Also, since these clarifications were shown to meet the intent of NUREG-1301 (superseding NUREG-0472) and the BVPS-1 and 2 UFSAR's, then the clarification will maintain the level of radioactive effluent control required by 10 CFR 20.1302, 40 CFR Part 190, 10 CFR 50.36a and Appendix I to 10 CFR 50. Also, the clarifications will not adversely impact the accuracy or reliability of effluent dose or setpoint calculation. Also, a 10 CFR 50.59 safety evaluation has concluded that no unreviewed safety question is involved by clarifying these actions. This conclusion is based on the following: (1) There is no increase in the probability or consequences of accidents or malfunctions of equipment important to safety. (2) There is no creation of a possibility for an accident or malfunction of a different type

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	than any evaluated previously. (3) There is no safety.	reduction		
8.2.9 <u>Change (9</u>) of BV-1 and 2 ODCM (Issue 3, Rev 2), Effective	ve May 199	<u>97</u>	
8.2.9.1 A de	escription of the changes implemented with this r	evision are	as follows:	
8.2.9.1.1	Index: Editorial changes were made for clarity	(See Just	ification 1)	
8.2.9.1.2	8.2.9.1.2 Section 1.0: Clarifying statements were added to Tables 1.2-1a and 1.2-1b to show that the recirculation times listed are based on historical recirculation rates. Figure 1.4-3 was added to show BV-1 and 2 liquid Effluent Release Points. (See Justification 1)			
8.2.9.1.3	8.2.9.1.3 <u>Section 3.0</u> : Removed the option to perform broad leaf vegetation sampling at the site boundary in a sector with the highest D/Q. (See Justification 2)			
8.2.9.1.4	Appendix C: Added plant specific Mark Numb 3.3-13 and 4.3-13 (See Justification 1). Correc Surveillance Requirement 4.11.4.1.1 (See Justi statements from NUREG-1301 and the Radiolo Technical Position to Tables 3.12-2 and 4.12-1 Removed the option to perform broad leaf vege boundary in a sector with the highest D/Q (See	ted typogra fication 1). ogical Asses (See Justif etation samp	phical errors on Added clarifying ssment Branch ication 1). pling at the site	
8.2.9.1.5	<u>Appendix E</u> : Corrected typographical error on Justification 1)	Table 6.9-1	. (See	
8.2.9.1.6	<u>Appendix F</u> : Added procedure details to Tables Justification 1)	s 11, 12 and	113. (See	
8.2.9.2 The	justification used for Change (9) to the ODCM a	re as follov	vs:	
8.2.9.2.1	These changes are considered editorial in nature typographical errors or add editorial details from documents. Therefore, these changes will main effluent control required by 10 CFR 20.1302, 4 50.36a and Appendix I to 10 CFR 50. Also, the adversely impact the accuracy or reliability of e calculations.	m previous ntain the lev 0 CFR Part e editorial o	ly approved station vel of radioactive t 190, 10 CFR changes will not	
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	This change removes the option to perform br the site boundary (in a sector with the highest census. Per NUREG-1301 and the Radiologic this option does not apply to plants with eleva have elevated releases, the option should not b garden census showed that the option was nev Since this change removes an option that shou change will maintain the level of radioactive e CFR 20.1302, 40 CFR Part 190, 10 CFR 50.30 50. Also, removal of the option will not adver reliability of effluent dose or setpoint calculati 0) of BV-1 and 2 ODCM (Issue 3, Rev 3), Effect escription of the changes implemented with this Section 2.0: A release point for the BV-2 Turb	D/Q) in lie val Branch ted releases e exercised er exercise ld not be e ffluent con 5a and App sely impac ons. <u>tive June 1</u> revision are	u of the garden Technical Position, s. Since BV-1 and 2 d. A review of past d at BV-1 and 2. xercised, then the trol required by 10 bendix I to 10 CFR t the accuracy or <u>997</u> e as follows:
	(for editorial purposes) to Figure 2.4-2.		
8.2.10.2 The	justification used for Change (10) to the ODCM	is as follo	ws:
8.2.10.2.1	This change is considered editorial in nature. item that was previously located on BV-2 Tech 5.1-2. Since BV-2 Technical Specification Ar figure, then the gaseous release point for the B needed transferred to the ODCM. Therefore, s editorial, the change will maintain the level of required by 10 CFR 20.1302, 40 CFR Part 190 Appendix I to 10 CFR 50. Also, the editorial of impact the accuracy or reliability of effluent do	nnical Spec nendment & V-2 Turbin since this ch radioactive 0, 10 CFR 5 change will ose or setpo	bification Figure 83 removed this be Building Vent hange is considered e effluent control 50.36a and hot adversely bint calculations.
8.2.11 <u>Change (1</u>	1) of BV-1 and 2 ODCM (Issue 3, Rev 4), Effec		· .
	escription of the changes implemented with this	revision are	e as follows:
8.2.11.1 A de 8.2.11.1.1	<u>Index</u> : Editorial changes were made for clarity	7.	

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8.2.11.1.3	Section 4.0: Added clarifying statements as		
7	effluents for MEMBERS OF THE PUBLIC site boundary are derived and reported. Th		
	Condition Report CR 971578.		
8.2.11.1.4	<u>Appendix C</u> : Added statements to Action 2 batch liquid releases may also be initiated w resuming the release. This is a recommend Assessment. A note was also added to this	vith the same ation from the table to clarif	Action needed for 1997 RETS Self- y that independent
-	signatures on the discharge permit satisfy the technically qualified members of the Facility release rate calculation" Added Action 22 3.3-13. This addition ensures consistency of gaseous effluent pathway Actions for Noble	ty Staff indepe 9 to RM-1GW with the other	endently verify the 7-108B on Table 7 continuous
· . ·	Added plant specific Mark Numbers for print instrumentation to Tables 3.3-13 and 4.3-12 Activity Monitors, [RM-1VS-109 Channel [RM-1VS-101B] and [RM-1V1S-110 Char to [RM-1VS-107B]. [RM-1GW-109 Chan alternate to [RM-1GW-108B] at this time, [mary and alte 3 as follows: 6 5] was added anel 5] was ad nel 5] was <u>not</u> because it doe	rnate (1) For Noble Gas as an alternate to ded as an alternate added as an s not perform on
	auto-isolation of gaseous waste decay tank (2) For Particulate Activity Monitors, [RM as an alternate to [RM-1VS-101A], [RM-1] an alternate to [RM-VS-1107A], and [RM- as an alternate to RM-1GW-108A.	-1VS-109 Ch VS-1110 Char	annel 1] was added nel 1] was added as
8.2.11.1.5	<u>Appendix E</u> : Corrected typographical error	s on Table E:6	5.9-1
8.2.11.1.6	<u>Appendix F</u> : Updated the procedure details instrumentation included in Appendix C Ta the amount of detail contained in reference so that the position of the surveillance on th having a need to change the Tables in this A Action to Condition Report CR 980129.	bles 3.3-13 ar to the Operati he logs can be	nd 4.3-13. Reduced ng Manual L-5 logs changed without
8.2.11.2 T	he justification used for Change (11) to the ODO	CM is as follo	ws:
8.2.11.2.1	These changes are considered editorial in n typographical errors or add editorial details documents. Therefore, these changes will n effluent control required by 10 CFR 20.130 50.36a and Appendix I to 10 CFR 50. Also adversely impact the accuracy or reliability calculations.	from previous naintain the le 2, 40 CFR Pa 5, the editorial	sly approved station evel of radioactive rt 190, 10 CFR changes will not

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8.2.12 Change (1	2) of BV-1 and 2 ODCM (Issue 3, Rev 5), E	ffective Nover	nber 1998
8.2.12.1 A d	escription of the changes implemented with t	his revision ar	e as follows.
8.2.12.1.1	Index: Editorial changes were made for cla	arity. (See Jus	tification 1.)
8.2.12.1.2	Section 1.0: Added clarification for calcula when the Post Dose Correction Factor is >	· .	
8.2.12.1.3	Section 3.0: Added an additional site location environmental surface water sample. Added collecting and compositing this sample. (S	d additional n	nethod after
8.2.12.1.4	Appendix C: Revised the definitions for M and UNRESTRICTED AREA to ensure co (See Justification 1.) Added a definition for PUBLIC to ensure compliance with 40 CFI Added plant specific Mark Numbers for print instrumentation to Table 3.3-13 that were in (11) to the ODCM. (See Justification 1.) A 2 as to where and when H-3 samples of Wa obtained. This is a Corrective Action to Co Justification 1.) Added clarification to not appropriate ventilation release path. This is 981490. (See Justification 1.). Corrected a 3.12-1 to ensure that 2 TLD's are used for c (See Justification 1.) Incorporated the appr that are described above for Section 3.0. (Section 2.).	mpliance with or MEMBER(S R 190.02(k). (imary and alten nadvertently of Added clarification ste Gas Storage ondition Report e "e" of Table s a Corrective in obvious om letermination of opriate change	10 CFR 20.1003. S) OF THE See Justification 1.) rnate mitted from change ation to Table 4.11- ge Tanks are to be rt CR 981489. (See 4.11-2 as to the Action to CR ission on Table of Direct Radiation. es to Table 3.12-1
8.2.12.1.5	<u>Appendix F</u> : Added procedure details from 6. This is a Corrective Action to Condition Justification 1.)		
8.2.12.2 The	justifications used for Change (12) to the OD	OCM are as fol	lows:
8.2.12.2.1	These changes are considered editorial in n typographical errors or add editorial details documents. Therefore, these changes will n effluent control required by 10 CFR 20.130 50.36a, and Appendix I to 10 CFR 50. Als adversely impact the accuracy or reliability	from previous naintain the le 2, 40 CFR Par o, the editorial	sly approved station evel of radioactive rt 190, 10 CFR I changes will not

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8.2.12.2.2 These changes involve the upstream env	vironmental surfa	ice water sample

These changes involve the upstream chynomichtal surface water sample method and sample site. Since these changes were shown to meet the intent of NUREG-1301, and BVPS-1 and 2 UFSAR's, then the change will maintain the level of radioactive effluent control required by 10 CFR 20.1302, 40 CFR Part 190, 10 CFR 50.36a and Appendix I to 10 CFR 50. Also, the change will not adversely impact the accuracy or reliability of effluent dose or alarm setpoint calculations. Also, a 10 CFR 10.50 safety evaluation has concluded that no unreviewed safety question is involved by adding an additional sample site and sample method. This evaluation is based on the following: (1) There is no increase in the probability or consequences of accidents or malfunctions of equipment important to safety. (2) There is no creation of a possibility for an accident or malfunction of a different type than any evaluated previously. (3) There is no reduction in the margin of safety.

8.2.13 Change (13) of BV-1 and 2 ODCM (Issue 3, Rev 6), Effective May 1999

- 8.2.13.1 A description of the changes implemented with this revision are as follows:
 - 8.2.13.1.1 Index: Editorial changes were made for clarity.
 - 8.2.13.1.2 <u>Section 3.0</u>: Updated figure number and table reference. Removed a redundant upstream environmental surface water sampling location.
 - 8.2.13.1.3 Appendix C: Made editorial changes for clarity. Added definitions for SHUTDOWN and STARTUP. Changed definition for ODCM to ensure agreement with definition provided in Unit 1/2 Technical Specification Amendments 220/97. Changed designations for primary and alternate instruments on Tables 3.3-12, 4.3-12, 3.3-13 and 4.3-13 from "P" and "A" to "Pri" and "Alt". Clarified use of the Flow Rate Measurement Devices for the Cooling Tower Blowdown Line on Tables 3.3-12 and 4.3-12 to show that the Unit 1/2 combined instrument [FT-1CW-101-1] is the primary and both of the individual Unit 1 and Unit 2 instruments [FT-1CW-101] and [2CWS-FT1011 are the alternates. Updated Actions 24, 25 and 26 of Table 3.3-12 to describe use of comparable alternate monitoring channels when the primary channels are INOPERABLE. Clarified Table 3.3-13 Action 28 applicability for Unit 2 gaseous effluent monitors. Clarified Table 3.3-13 Action 30 to show that applicability is for batch purges of the reactor containments. Changed reference of Special Report compliance requirement from Technical Specification 6.9.2f to 10 CFR 20.2203 and 10 CFR 50.4 as permitted by Unit 1/2 Technical Specification Amendments 220/97. Clarified note b of Table 4.11-2 regarding sampling and surveillances frequencies. Clarified Controls 3.12.1 and 3.12.2 to ensure compliance with NUREG-1301.

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8.2.13.1.4	Appendix E: Made editorial changes for clari Special Report compliance requirement from to 10 CFR 20.2203 and 10 CFR 50.4 as perm Specification Amendments 220/97. Changed REMP report from May 1 to May 15 as perm Specification Amendments 220/97. Changed E: 6.9-1 to ensure consistency with NUREG-	Technical S itted by Un submittal c itted by Uni column he	Specification 6.9.2f it 1/2 Technical late of annual it 1/2 Technical
8.2.13.2 The	justification used for change (13) to the ODCM	1 is as follow	ws:
8.2.13.2.1	All changes are considered editorial in nature intent of the original specification or add equi guidance document (NUREG-1301) or recent Amendments. Therefore, since these changes changes will maintain the level of radioactive CFR 20.1302, 40 CFR Part 190, 10 CFR 50.3 50. Also, the editorial changes will not adver reliability of effluent dose or set point calculatio	valent item Technical are conside effluent co 6a and App sely impact	s form the standard Specification ered editorial, the ntrol required by 10 pendix I to 10 CFR
	14) of BV-1 and 2 ODCM (Rev 14), Effective M		
Rev but	or to this ODCM change, the change numbers division numbers. For example, the last implement carried an Issue 3, Revision 6 designation. The orthogonal provides the second secon	ted ODCM refore, as of	change was (13), this ODCM change
8.2.14.2 A d	escription of the changes implemented with this	revision ar	e as follows:
8.2.14.2.1	Index: Editorial changes were made for clarit reports CR 982097, CR 992652 and CR 9930		
8.2.14.2.2	Appendix C: Editorial changes were made for typographical error on Table 3.3-12 in regards the grab sampling requirement from 8 hours t Action 24 (NUREG-1301, Table 3.3-12, Acti change). Enhanced the Channel Functional T 12 from Q(6) to Q(1) for RM-1DA-100 (Corr Report CR 993021). Add clarification to Tab the plant specific Mark Numbers for the prim Flow Rate Measuring Devices. Corrected a ty 3.3-13 Action 27. Separated Action 28 of Tal Action 28 requirements for System Effluent F Devices/Process Flowrate Monitors and indiv for Sample Flow Rate Measuring Devices/San Added clarification to Table 3.3-13 to show th applicable for continuous releases. Added an	s to FT-CW o 12 hours f on 36 and 3 est requirem ective Action le 3.3-13 and ary and alte /pographica ble 3.3-13 in low Rate M idual Action nple Flowra hat Action 2	-101-1. Changed for Table 3.3-12 7 allow this nents on Table 4.3- on to Condition ad 4.3-13 to show rnate BV-1 Sample 1 error on Table nto individual leasuring n 28 requirements ate Monitors. 29 and Action 32 are

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grab sample collection (ie., local monitor readings can be obtained when communication is lost to the Control Room) to show compliance to Table 3.3-13 Action 29. Changed the grab sampling requirement from 8 hours to 12 hours for Table 3.3-13 Action 29 and Action 32 (NUREG-1301, Table 3.3-013, Action 47 allows this change). Corrected typographical errors on Table 4.11-1 in regards to liquid composite analysis frequency and table notation.

8.2.14.2.3

<u>Appendix F</u>: Made editorial changes for clarity. Updated the procedure details for primary and alternate instrumentation included in Appendix C Tables 3.3-13 and 4.3-13. Added appropriate references to the HP Shift Logs (ie., HPM Appendix 1) when these logs are used satisfy ODCM Appendix C Surveillances and Actions (Corrective Action to Condition Report CR 992652).

8.2.14.3 The justification used for change (14) to the ODCM is as follows:

8.2.14.3.1 Most of these changes are considered editorial in nature. All changes were screened for 10CFR50.59 applicability. In summary, the BVPS-1 and 2 UFSAR's are not impacted, because the changes either clarify the intent of the original specification, add plant specific Mark Numbers, or add equivalent items from the standard guidance document (NUREG-1301). Therefore, these changes will maintain the level of radioactive effluent control required by 10CFR20.1302, 40CFR Part 190, 10 CFR50.36a, and Appendix I to 10CFR50. Also, these changes will not adversely impact the accuracy or reliability of effluent dose or alarm setpoint calculations.

8.2.15 Change (15) of BV-1 and 2 ODCM (Rev 15), Effective August 2000

8.2.15.1 A description of the changes implemented with this revision are as follows:

- 8.2.15.1.1 <u>Index</u>: Editorial changes were made for clarity. Reference to Condition Report CR 001682 was added. Reference to NRC unresolved Item 83-30-05 was added.
- 8.2.15.1.2 <u>Appendix C</u>: Editorial changes were made for clarity. Annotated Actions 28 of Table 3.3-13 into Action 28A and 28B to show differentiation between Action 28A requirements for system/process flow rate measurement and Action 28B requirements for sampler flow rate measurement. Added an alternate method in lieu of 4 hour flow rate estimations (ie; assume ODCM design values for system/process flow rate) to show compliance with Table 3.3-13 Action 28A when the system/process flow rate monitor is inoperable. Annotated Actions 30 of Table 3.3-13 into Action 30A and 30B to show differentiation between Action 30A requirements for BV-1 reactor containment purges and Action 30B requirements for BV-2 reactor containment purges.

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8.2.15.2 The justification used for change (15) to the ODCM is as follows:

8.2.15.2.1 Some of these changes are considered editorial in nature. These changes were screened for 10CFR50.59 applicability and determined not to impact the BVPS-1 and 2 UFSAR's. Since the editorial changes clarify the intent of the original specification, then these changes will maintain the level of radioactive effluent control required by 10CFR20.1302, 40CFR Part 190, 10CFR50.36a, and Appendix I to 10CFR50. Also, these changes will not impact the accuracy or reliability of effluent dose or alarm setpoint calculation.

8.2.15.2.2 The change to allow use of design (maximum) system flow rates in lieu of 4 hour flow rate estimations (for five of the eight gaseous effluent release pathways) was screened for 10CFR50.59 applicability and determined not to impact the BVPS-1 and 2 UFSAR's. The 4 hour flow rate estimations for these effluent release pathways have never been used in ODCM Dose and Dose Rate Calculations. The method for use of process flow rates in ODCM Dose and Dose Rate Calculations remains unchanged. For example, BVPS-1 and BVPS-2 is currently using, and will continue to use design (maximum) system flow rates in ODCM Dose and Dose Rate Calculations for all eight gaseous effluent release pathways. This is necessary to ensure that DLC response to NRC Unresolved Item 50-334/83-30-05 is not compromised. Also this change is considered similar and within the justification provided for ODCM change (8) that removed all of the process flow rate operability and surveillance requirements for the other three gaseous effluent release pathways. Based on the above, these changes will maintain the level of radioactive effluent control required by 10CFR20.1302, 40CFR Part 190, 10CFR50.36a, and Appendix I to 10CFR50. Also, these changes will not impact the accuracy or reliability of effluent dose or alarm setpoint calculation.

8.2.16 Change (16) of BV-1 and 2 ODCM (Effective April 2002)

8.2.16.1 A description of the changes implemented with this revision are as follows:

8.2.16.1.1 The entire BV-1 and 2 ODCM was converted to the ODC format as delineated in 1/2-ADM-0100. As part of this process, the ODCM was separated into eight procedures as follows:

8.2.16.1.1.1 <u>1/2-ODC-1.01, Rev 0;</u> ODCM: Index, Matrix and History of ODCM Changes (formerly; ODCM Index and Appendix F)

8.2.16.1.1.2 <u>1/2-ODC-2.01, Rev 0;</u> ODCM: Liquid Effluents (formerly; ODCM Section 1 and 5)

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;	8.2.16.1.1.	3	<u>1/2-ODC</u> Section 2		<u>, 0;</u> ODC	CM: Gas	eous Effluent	ts (for	merly; ODCM	
				·						
	8.2.16.1.1.	4					iological Env CM Section 3		nental	
	8.2.16.1.1.	5		<u>-2.04, Rev</u> ; ODCM S			rmation Rela	ted to	40CFR190	
	8.2.16.1.1.	6			-	-	persion Calcu DCM Apper		al Procedure & & B)	
	8.2.16.1.1.	7 .		<u>-3.02, Rev</u> ppendix E		M: Bas	es for ODCM	l Cont	rols (formerly;	
	8.2.16.1.1.	8					trols for RET lix C and E)	TS and	REMP	
	8.2.16.1.2	was o	duplicated	in the Base	es for O	DCM Co	al Specification trols as per 246/2A-124. ⁽²	mitted		
	8.2.16.1.3	3.3.3 ODC Ame High 9), R and 1 Discl Pump Moni when consi (or ap	1 (includin M Control andments 1 Range Ch M-1VS-11 109D], the harge Mon p Turbine I itoring (PM n the prima idered an e	ng portion ls as permi A-246/2A- annels of 1 0 (7 and 9 Atmosphe itors [RM- Exhaust M IM) was a ry instrum ditorial ch form numl	s of Tab itted by 1 -124. ^(3.2.) Noble G), RM-1 eric Stean -1MS-10 lonitor [] lon adde lent is in ange bec ber), wh	les 3.3-6 Unit 1/2 ^{6.8)} Spec as Efflue GW-109 m Dump 00A, B as RM-1MS od for cla operable cause it r	and 4.3-3) w Technical Spe ifically, this i ant Monitors [(7 and 9), an Valve/Code ad C] and Au S-101]. The F rification of m Addition of merely specifi	rere tra ecifica Includ [RM-] Id 2H Safety Xiliar Prepla necess f the P es the	es the Mid and IVS-109 (7 and VS-RQ109C V Relief Valve y Feedwater nned Method of ary actions	
	8.2.16.1.4	3.3.3 to the	.9 Table 3. e initial bat	3-13 to sh tch purge c	ow that of the rea	Action 3 actor con	tainment atm	on 3B Iosphe	CM Control are applicable re. All other ial batch purge)	

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8.2.1	O Fl 21	<u>cocedure 1/2-ODC-3.03, Rev 0</u> : Added DCM Control 3.3.3.10 Table 3.3-13 and ow Rate Monitor flow transmitters [2H HVL-FIT112-1 and 2RMQFIT303-1] ma	l Table 4.3-13 t VS-FIT101-1, 2 ay be used as co	o show that Sample RMQ-FIT301-1, omparable alternates
	21 IN	hen the primary instruments [RM-11 Me RMQ-RQ301, 2HVL-RQ112 and 2RMC IOPERABLE. This is considered an ed	2-RQ303], resp torial change b	ectively, are ecause the primary
		onitoring channel (i.e.; RM-11 Monitor s input from these same flow transmitter		ly aiready receives
8.2.1		ocedure 1/2-ODC-3.03, Rev 0: Added r able 3.3-13 and Table 4.3-13 to show that		
	be	e used as a comparable alternate to [RM- leases. However, since [RM-1GW-109 itomatic isolation of gaseous waste deca	1GW-108B] fo Channel 5] can	or continuous not perform an
	nc al	otation was also added to prevent using t ternate for batch releases. This is consid	his monitor as a lered an editori	a comparable al change because it
		erely specifies the asset number of a red annel that was included in previously ap		
8.2.10	A 13 cc pr th	ocedure 1/2-ODC-3.03, Rev 0: Replace ctivity Monitors" in ODCM Control 3.3 8 with requirements for "Particulate and onsidered an editorial change because the eparation of ODCM Controls (NUREG at the requirements listed in these Table amplers", and not for the "Particulate Ac	3.10 Tables 3.2 Iodine Sampler NRC guidanc 1301) contains s are for the "Pa	3-13 and Table 4.3- s". This is e document used for the clarification articulate and Iodine
8.2.16.2	The just	ification used for change (16) to the OD	CM is as follow	ws:
8.2.10	al ar ar pe in or	ne specific radiation monitoring channel arms and indications to alert plant perso ad to assist in evaluating and trending pla oplicable if the monitors are inoperable r erformed on a daily basis, or that explana an annual effluent report. The Actions berability of other systems nor do the Actions terminated at any time.	nnel of high rac ant effluents. T equire only that ations of inoper do not impact of	liation conditions he Actions t area surveys be ability be provided or reference the
8.2.10	pr ac th	ome of the radiation monitoring effluent ovide indications used to assess selected cident consistent with the recommendat e monitors do not provide indication for een identified as Regulatory Guide 1.97	l plant paramete ions of NURE(post accident v	ers following an G-0737. However, variables that have

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8.2.16.2.3	The Safety Analysis performed for the License the radiating monitoring channels transferred effectiveness of the requirements being reloca results in a change in the regulatory control re to the requirements. The requirements will cont the appropriate plant procedures in the same m future changes to the transferred requirements accordance with 10 CFR 50.59 instead of requi 10 CFR 50.90.	to the ODCl ted. Rather quired for fu ntinue to be nanner as be will be con	M do not reduce the , the transferred uture changes made implemented by fore. However, trolled in
8.2.16.2.4	Based on the above, these changes will mainta effluent control required by 10 CFR 20.1302, 50.36a, and Appendix I to 10 CFR 50. Also, the accuracy or reliability of effluent dose or a	40 CFR Par hese change	t 190, 10 CFR es will not impact
8.2.17 <u>Change (</u>	17) of BV-1 and 2 OCDM (Effective August 200	<u>2)</u>	
8.2.17.1 A d	lescription of the changes implemented with this	revision are	as follows:
8.2.17.1.1	<u>Procedure 1/2-ODC-3.03, Rev 1</u> : Technical Sp Liquid Storage Tank Activity Limits, and LCC Tank Activity Limits were transferred to ODC 3.11.2.5 respectively as permitted by Unit 1/2 Amendments 1A- 250/2A-130. ^(3.2.6.9)) 3.11.2.5, f M Controls	or Gas Storage 3.11.1.4 and
8.2.17.1.1	1.1 As part of the preparation work for trans Activity Limits to the ODCM, the 10 Cure-verified and documented in Calculatio 007. ^(3.2.3.9) The results of this calculation limits to ensure that the 10CFR20 Appe Limits will be maintained should an acc contents occur. Previously, LCO 3.11.1 Curies for each of the four tanks listed. documentation for derivation of the 10 C located in the records storage system.	urie Limit fo on Package n provide tai ndix B Tabl idental relea .4 used a ge However, fo	or these tanks was ERS-ATL-95- nk specific activity e 2, Col. 2 EC use of the tank(s) neric limit of 10 ormal
8.2.17.1.1	1.2 In addition, individual tank Activity lim 1 and 2 Refueling Water Storage Tanks added to this ODCM Control. The Surv determination of RWST Activity will no days like the other Liquid Storage Tanks is not added to the RWST's on a weekly surveillance for determination of (RWS within 7 days of returning reactor cavity back to the RWST (i.e.; during a refueli	(RWST's), v eillance Rec ot be perform s, because ra basis. Then T's) Activity water (radio	which were also quirements for ned once per 7 adioactive material refore, the will be performed

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	8.2.17.1.2	Procedure 1/2-ODC-3.03, Rev 1: Change	d the due date of	f the Annual
		Radioactive Effluent Release Report from		
		Unit 1/2 Technical Specification Amendr	nents 1A-250/2.	A-130. ^(3.2.6.9)
	8.2.17.1.3	Procedure 1/2-ODC-3.03, Rev 1: Change	d Table 3.3-12 (of Control 3.3.3.9 to
	· · · · · · · · · · · · · · · · · · ·	correct an obvious omission of Channel C		
		Requirements for Flow Rate Measuremer	nt Device [FR-1]	LW-103] on the
		Liquid Waste Containment Drain Line. T	This obvious om	ission is detailed in
		CR 02-05533. ^(3.2.2.12)		
	8.2.17.1.4	Procedure 1/2-ODC-3.03, Rev 1: Made ea	ditorial changes	to correct the
		primary asset numbers of the BVPS-2 San		
		on Tables 3.3-13 and 4.3-13 of Control 3.	.3.3.10. These c	hanges clarify that
		the primary Sampler Flowrate Monitor is	•	
		monitoring sample flowrate through the P		-
		Flowpath, not the Particulate and Iodine N	Monitoring Flow	vpani.
8.	2.17.2 The	e justification used for change (17) of the OI	DCM is as follow	ws:
	8.2.17.2.1	These changes merely transfers existing s	torage tank activ	vity limits from the
		Technical Specification to the ODCM and	-	-
		Annual Radioactive Effluent Release Rep	-	•
		Technical Specification Amendments 1A		-
		change, the ODCM Control for Liquid St	•	•
		enhanced to add ODCM Controls and Sur Unit 1 and Unit 2 RWST's. Therefore, th	•	
		Technical Specification Amendments) wi		
		effluent control required by 10 CFR 20.13		
		50.36a, and Appendix I to 10 CFR 50. A	lso, these chang	es will not impact
		the accuracy or reliability of effluent dose	or alarm setpoi	nt calculation.
8.2.1	8 <u>Change (</u>	18) of the BV-1 and 2 ODCM (Effective Oct	tober 2002)	
8.:	2.18.1 A d	lescription of the changes implemented with	this revision are	e as follows:
	8.2.18.1.1	Procedure 1/2-ODC-3.03, Rev 2: Added r	requirement for	applicable station
	5.2.10.1.1	groups notification of pending ODCM ch	•	
		05711. ^(3.2.2.13)	-	
8.2	2.18.2 The	e justification used for change (18) of the OD	OCM is as follow	vs:
	8.2.18.2.1	This change is considered editorial in natu		
		from Regulatory Applicability Determina		
		not impact the level of radioactive effluen	-	•
		10CFR20.1302, 40CFR Part 190, 10CFR		
		10CFR50. Also this change will not impa	act the accuracy	or renability of

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8.2.19 <u>Change</u>	(19) of BV-1 and 2 ODCM (Effective Novem)	<u>ber 2002)</u>	
8.2.19.1 A	description of the changes implemented with	this revision ar	e as follows:
8.2.19.1.1	Procedure 1/2-ODC-2.01, Rev 1: Changed		
	Zn-65 to the respective BV-1 and 2 Liquid		
	02-06174 (CA-01, CA-13 and CA-14). Fo		•
	to the reactor coolant system in an effort to	•	
	primary system materials and mitigation o		-
· _	benefits to zinc addition involve preferenti		
	which, in-turn, reduces plant dose rates. D	· •	*
	Annual Release Activity is delineated in C		
	$83-027.^{(3.2.3.1)}$ Addition of Zn-65 to the so		-
	the Liquid Effluent Monitor Alarm Setpoin	nts, and approp	oriate monitor
	conversion factors.		
8.2.19.1.2	Procedure 1/2-ODC-2.01, Rev 1: Table 1.	l-la was chang	ged to update the
	remainder of the source term with annual r		
	Webster Calculation Package No. UR(B)-	160. ^(3.2.3.10)	
8.2.19.1.3	Procedure 1/2-ODC-2.01, Rev 1: Editorial	changes were	made to this
0.2.17.1.5	procedure for update of ODCM references	-	
	Liquid Waste Evaporators are no longer us		•
	waste.		··· p······ ··· ···
8.2.19.2 Th	e justification used for change (19) of the OD	CM is as follo	ws:
8.2.19.2.1	Addition of Zn-65 to the BV-1 and 2 Liqu	id Source Tern	ns, along with
	update of the BV-1 and 2 Liquid Source T	erm is conside	red a procedure
	correction, and is enveloped by the Regula	tory Applicabi	lity Determination
	performed for BV-1 ECP-02-0410. Based	on the above,	these changes will
	maintain the level of radioactive effluent c	ontrol required	l by 10 CFR
	20.1302, 40 CFR Part 190, 10 CFR 50.36a	, and Appendi	x I to 10 CFR 50.
and a second	Also, these changes will not impact the acc	curacy or reliab	oility of effluent
· · ·	dose or alarm setpoint calculation.		
8.2.20 <u>Change (</u>	(20) of BV-1 and 2 ODCM (Effective October	<u>2003)</u>	
8.2.20.1 A	description of the changes implemented with t	this revision ar	e as follows:
8 2 20 1 1	Proceedure 1/2 ODC 2.01 Pey 2: Changed	I W System d	ingrame
8.2.20.1.1	<u>Procedure 1/2-ODC-2.01, Rev 2</u> : Changed (Attachment D) to indicate the flow path for	•	-
	Unit 1 and Unit 2.	or cross conne	
8.2.20.1.2	Procedure 1/2-ODC-2.02, Rev 1: Changed		
	term for the Unit 1 Containment Vacuum	Pumps as desci	ribed in CR03-
	04830 (CA-03).		

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8.2.20.1.3	Procedure 1/2-ODC-3.03, Rev 3: Chang	ed the Preplanne	d Method of
	Monitoring (PMM) in Attachment D Ta	ble 3.3-6 and Tal	ble 4.3-3.
	Specifically, the 2nd PMM for the Reac		
	Range Noble Gas Monitors (RM-1VS-1	U	U
	FROM "(RM-1VS-107B)" TO "(RM-1V		Ũ
	Also, the 2nd PMM for the Auxiliary Bu	-	,
·	High Range Noble Gas Monitors (RM-1	•	•
. •	FROM "(RM-1VS-101B)" TO "(RM-1V		
ι.	Similarly, the 2nd PMM for the Gaseous		
· -	High Range Noble Gas Monitors (RM-1		•
	FROM "(RM-1GW-108B)" TO "(RM-1		<i>,</i> ,
	,,,	- · · · - , - · ·	·
8.2.20.1.4	Procedure 1/2-ODC-3.03, Rev 3: Chang	ed Attachment J	Control 3.11.1.4 to
	update the activity limits for the liquid s	torage tanks to th	e values specified
	in Calculation Package No. ERS-ATL-9	5-007.	- .
	-		
8.2.20.1.5	Procedure 1/2-ODC-3.03, Rev 3: Chang		
	add more specific guidance for sampling		•
	Specifically, this table is generic for Uni		
	Pathways, but sampling may only need r		
	Effluent Pathways rather than all of the		• •
	be inferred from the wording in the Tabl	•	•
	unnecessary sampling, applicability state		
	delineate which ventilation systems are a		
	(f) includes a clarification of how compl		irement is achieved
	per response to NRC Unresolved Item 5	0-334/83-30-05.	
8.2.20.2 Th	e justifications used for change (20) of the (DDCM are as fol	lows:
8.2.20.2.1	Procedure 1/2-ODC-2.01, Rev 2: Chang	ing the diagram t	o show the LW
0.2.20.2.1	cross connect between Unit 1 and Unit 2		
	configuration, and is considered a proce		
:	procedure of the ODCM already describ		
	system. Also, the UFSAR's describe the		
	this change will maintain the level of rac		
	10 CFR 20.1302, 40 CFR Part 190, 10 C		
	CFR 50. Also, this change will not impa		
· .	effluent dose or alarm setpoint calculation	•	- Longonity Of
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8.2.20.2.2 Procedure 1/2-ODC-2.02, Rev 1: The original source-term calculation for the GW System was based on an operating flow rate of 5 scfm for the Unit 1 containment vacuum pumps. The flow rate for the new pumps is 70 scfm. Consequently, the source-term was revised per Calculation Package ERS-HHM-87-014 and then transcribed to this procedure. Although the new pumps represent a factor of 15 increase in flow rate, the gaseous effluent monitor alarm setpoints are unchanged. Specifically, the previous setpoints were based on a percentage of Offsite Dose Rate Limits, and those values were actually above the range of the instruments, so an on-scale value was substituted. This is also true for the re-calculated setpoints, so the same onscale values are used. In summary, changing the source term is considered a procedure correction, and is enveloped by the Regulatory Applicability Determination performed for BV-1 ECP-02-0079. Based on the above, this change will maintain the level of radioactive effluent control required by 10 CFR 20.1302, 40 CFR Part 190, 10 CFR 50.36a, and Appendix I to 10 CFR 50. Also, this change will not impact the accuracy or reliability of effluent dose or alarm setpoint calculation. This procedure change implements a Corrective Action per CR03-04830-03.

8.2.20.2.3 Procedure 1/2-ODC-3.03, Rev 3: Changing the Preplanned Method of Monitoring (PMM) will prevent unnecessary grab sampling (ie; the 3rd PMM) when the primary channel for the Mid or High Range Noble Gas Monitor is inoperable. Specifically, **IF** other Noble Gas Monitoring channels are available on that effluent pathway, **THEN** monitoring should be assumed with those channels as the 2nd PMM. In summary, the 3rd PMM (ie; obtaining grab gas samples every 12 hours) should only be performed as a last resort to a complete lack of continuous noble gas monitoring channels being available on that effluent pathway. Based on the above, this change will maintain the level of radioactive effluent control required by 10 CFR 20.1302, 40 CFR Part 190, 10 CFR 50.36a, and Appendix I to 10 CFR 50. Also, this change will not impact the accuracy or reliability of effluent dose or alarm setpoint calculation. This procedure change implements a Corrective Action per CR03-06123-01.

8.2.20.2.4

<u>Procedure 1/2-ODC-3.03, Rev 3:</u> Changing the activity limits for liquid storage tanks does not affect original plant accident analyses. Specifically, the original analyses were performed in accordance with NUREG-0800 SRP 15.7.3 using the best available data at that time. The updated analyses were also performed in accordance the same NUREG, but current (more accurate) data was used to determine allowable activity content in each tank. Based on the above, this change will maintain the level of radioactive effluent control required by 10 CFR 20.1302, 40 CFR Part 190, 10 CFR 50.36a, and Appendix I to 10 CFR 50. Also, this change will not impact the accuracy or reliability of effluent dose or alarm setpoint calculation. This procedure change implements a Corrective Action per CR03-07487-05.

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8.2.20.2.5 8.2.21 <u>Change (</u>	Procedure 1/2-ODC-3.03, Rev 3: Changin add more specific guidance for sampling considered a simple change. Specifically unnecessary sampling of unaffected venti above, this change will maintain the level required by 10 CFR 20.1302, 40 CFR Par Appendix I to 10 CFR 50. Also, this chan reliability of effluent dose or alarm setpoi change implements a Corrective Action p 21) of BV-1 and 2 ODCM (Effective Novem	of Gaseous Effl , this change me lation pathways of radioactive t 190, 10 CFR inge will not imp nt calculation. er CR03-06281	K Table 4.11-2 to luent Pathways is erely prevents 5. Based on the effluent control 50.36a, and bact the accuracy or This procedure
8.2.21.1 A d	lescription of the changes implemented with	this revision ar	e as follows:
8.2.21.1.1	Procedure 1/2-ODC-1.01, Rev 4, Procedure Procedure 1/2-ODC-3.03, Rev 4: Change Radiation Protection Section to the Nucle Section per CR05-01169-14, CR05-01169	re 1/2-ODC-2.0 d ownership of ar Environment	01, Rev 3 and procedures from the tal & Chemistry
8.2.21.1.2	Procedure 1/2-ODC-2.01, Rev 3: Change volume of Liquid Waste Drain Tanks (2L gal/tank to 10,000 gal/tank.	~	
8.2.21.1.3	Procedure 1/2-ODC-3.03, Rev 4: Change increased flexibility in Mode restraints the 193 and CR03-09288-19.		-
8.2.21.1.4	Procedure 1/2-ODC-3.03, Rev 4: Corrector Attachment O, Control 3.11.2.5 per CR03 word in Action (a) was changed from "na	8-11726-01. Spe	
8.2.21.1.5	<u>Procedure 1/2-ODC-3.03, Rev 4</u> : Revised 4.3-13) to correct a typographical error pe the Asset Number for the Vacuum Gauge flow (from the Alternate Sampling Device to [PI-1GW-135].	r CR04-01643- used for measu	01. Specifically, rement of sample
8.2.21.1.6	Procedure 1/2-ODC-3.03, Rev 4: Revised 4.3-13) per CR04-02275-01. Specifically indicate that the "Sampler Flow Rate Mor" "Particulate and Iodine Sampling".	, clarification w	as provided to
8.2.21.1.7	<u>Procedure 1/2-ODC-3.03, Rev 4</u> : Revised ACTION a, to add clarification that requir Part 20 EC's when the individual tank lim	res specific calc	ulation of 10 CFR
8.2.21.2 The	e justifications used for change (21) of the O	DCM are as fol	lows:

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· ·	8.2.21.2.1	 <u>Procedure 1/2-ODC-1.01, Rev 4, Procedure 1/2</u> <u>Procedure 1/2-ODC-3.03, Rev 4</u>: Changing ow from Radiation Protection to Nuclear Environr considered a procedure correction. <u>SINCE</u> the RETS, REMP and ODCM responsibilities to a changes will maintain the level of radioactive of CFR 20.1302, 40 CFR Part 190, 10 CFR 50.36 50. Also, the changes will not impact the accur dose or alarm setpoint calculation. The proced Corrective Actions per CR05-01169-14, CR05 	vnership of nental & C changes n different r effluent co a, and Ap racy or rel ure chang	f these procedures Chemistry is merely transfers manager, <u>THEN</u> the introl required by 10 pendix I to 10 CFR iability of effluent es implement
		21.		
	8.2.21.2.2	<u>Procedure 1/2-ODC-2.01, Rev 3:</u> Changing the Waste Tank is considered a procedure correction typographical error on the Attachment, <u>THEN</u> tank volume that is used in effluent release called determinations. Therefore, this change will man effluent control required by 10 CFR 20.1302, 4 50.36a, and Appendix I to 10 CFR 50. Also, the accuracy or reliability of effluent dose or alarm	on. <u>SINC</u> it does not culations a intain the 0 CFR Pa nis change	<u>E</u> this was a t impact the actual and offsite dose level of radioactive art 190, 10 CFR will not impact the
	8.2.21.2.3	<u>Procedure 1/2-ODC-3.03, Rev 4:</u> Changing Att increased flexibility in Mode restraints (describ is considered a simple change. <u>SINCE</u> the cha provided in the Technical Specifications, <u>THE</u> level of radioactive effluent control required by Part 190, 10 CFR 50.36a, and Appendix I to 10 will not impact the accuracy or reliability of eff calculation. This procedure change implement CR03-09288-19.	bed in LAI nge implea M the char 10 CFR 2 CFR 50. fluent dose	R 1A-321/2A-193) ments guidance nge will maintain the 20.1302, 40 CFR Also, this change e or alarm setpoint
	8.2.21.2.4	Procedure 1/2-ODC-3.03, Rev 4: The typograp Control 3.11.2.5 is considered a procedure corr change will maintain the level of radioactive ef CFR 20.1302, 40 CFR Part 190, 10 CFR 50.36 50. Also, this change will not impact the accur dose or alarm setpoint calculation. This proceed Corrective Action per CR03-11726-01.	fluent con a, and Ap acy or reli	herefore, this atrol required by 10 pendix I to 10 CFR iability of effluent

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	8.2.21.2.5	<u>Procedure 1/2-ODC-3.03, Rev 4:</u> Correction Attachment F, (Table 3.3-13 and 4.3-13) is correction. <u>SINCE</u> this change merely co- change will maintain the level of radioact CFR 20.1302, 40 CFR Part 190, 10 CFR 50. Also, this change will not impact the dose or alarm setpoint calculation. This p Corrective Action per CR04-01643-01.	is considered a p rrects an obvious ive effluent cont 50.36a, and App accuracy or relia	rocedure s error, <u>THEN</u> this rol required by 10 endix I to 10 CFR bility of effluent	
	8.2.21.2.6	<u>Procedure 1/2-ODC-3.03, Rev 4:</u> Providin Flow Rate Monitors is considered a simple to misinterpret which filter paper sampler the specification was referring to. <u>SINCE</u> samplers used for effluent release calculat <u>THEN</u> this change will maintain the level required by 10 CFR 20.1302, 40 CFR Par Appendix I to 10 CFR 50. Also, this char reliability of effluent dose or alarm setpoi change implements a Corrective Action p	e change, becaus (e.g.; moving fil no changes wer ions or offsite de of radioactive et t 190, 10 CFR 50 nge will not impa nt calculation. T	ter or fixed filter) e made to actual ose determinations, ffluent control 0.36a, and act the accuracy or his procedure	
	8.2.21.2.7	Procedure 1/2-ODC-3.03, Rev 4: Providin calculation of 10 CFR Part 20 EC's (when exceeded) is considered a simple change. limits were derived from an assumed sour representative of the actual source term at also ensures that a "Special Report" is sub 20 EC limits are actually exceeded (i.e.; we analysis) at the nearest surface water supply supply in the unrestricted area. Per Calcu 007 ^(3.2.3.9) , the nearest surface water supply supply are considered to be the entrance to Facility. <u>SINCE</u> no changes were made to limits, <u>THEN</u> this change will maintain the control required by 10 CFR 20.1302, 40 C Appendix I to 10 CFR 50. Also, this char reliability of effluent dose or alarm setpoin	the individual the specifically, the specifically, the ce-term and may time of sample. Somethed only when calculated with the nearest lation Package New and the nearest of the Midland We the bases for the level of radioa CFR Part 190, 10 and will not impart to the second sec	ank limits are individual tank not be This clarification in the 10 CFR Part using actual sample to potable water to. ERS-ATL-95- t potable water ater Treatment e tank activity ctive effluent CFR 50.36a, and	

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8.2.22 Change (22) of BV-1 and 2 ODCM (Effective August 2006)

- 8.2.22.1 A description of the changes implemented with this revision are as follows:
 - 8.2.22.1.1 <u>Procedure 1/2-ODC-2.01, Rev 4</u>: Incorporated Improved Technical Specification Reference changes from T.S. 6.8.6 to T.S. 5.5.2, per CR05-03306. Revised the alarm setpoints of [RM-1RM-100] and [RM-1DA-100] via vendor calculation Package No. 8700-UR(B)-223. These changes reflect the Extended Power Uprate (EPU) at Unit 1 per ECP-04-0440, Unit 1 TS Amendment No. 275 and CR06-04908-03. Updated the figure of Liquid Effluent Release Points (Attachment D, Figure 1.4-3) to incorporate a modified version of Plant Drawing No. 8700-RM-27F per CR05-03854-01.

8.2.22.1.2 Procedure 1/2-ODC-2.02, Rev 2: Changed ownership of procedure from the Radiation Protection Section to the Nuclear Environmental & Chemistry Section per CR05-01169-16. Incorporated a "≤" designation for all low range noble gas effluent monitor alarm setpoints to meet the provisions of vendor calculation Package No. 8700-UR(B)-223. These changes reflect the Extended Power Uprate (EPU) at Unit 1 per ECP-04-0440, Unit 1 TS Amendment No. 275 and CR06-04908-04.

8.2.22.1.3 <u>Procedure 1/2-ODC-3.03, Rev 4</u>: Revised the alarm setpoints of the mid range and high range noble gas effluent monitors via vendor calculation Package No. 8700-UR(B)-223. These changes reflect the Extended Power Uprate (EPU) at Unit 1 per ECP-04-0440, Unit 1 TS Amendment No. 275 and CR06-04908-03.

8.2.22.2 The justifications used for change (22) of the ODCM are as follows:

8.2.22.2.1

Procedure 1/2-ODC-2.01, Rev 4: Updating the alarm setpoints and the figure of liquid effluent release points are considered procedure corrections, because they merely update the ODCM to agree with previously approved documents that were implemented with TS Amendments. <u>SINCE</u> the change merely updates the ODCM, <u>THEN</u> the change will maintain the level of radioactive effluent control required by 10 CFR 20.1302, 40 CFR Part 190, 10 CFR 50.36a, and Appendix I to 10 CFR 50. Also, the change will not impact the accuracy or reliability of effluent dose or alarm setpoint calculation. <u>SINCE</u> PORC review & acceptance is required per TS 6.14 and 1/2-ADM-1640, <u>THEN</u> the review is considered complete per Regulatory Applicability Determination RAD-06-03831, RAD-06-01658 and RAD-06-05070. As previously noted, these procedure changes implement Corrective Actions per CR06-04908-03, and CR05-03854-01.

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8.2.22.2.2 Procedure 1/2-ODC-2.02, Rev 2: Changing the ownership of the procedure and updating the alarm setpoints with a "≤" designation are considered procedure corrections, because they merely update the ODCM to agree with previously approved documents that were implemented with TS Amendments. SINCE the change merely updates the ODCM, THEN the change will maintain the level of radioactive effluent control required by 10 CFR 20.1302, 40 CFR Part 190, 10 CFR 50.36a, and Appendix I to 10 CFR 50. Also, the change will not impact the accuracy or reliability of effluent dose or alarm setpoint calculation. SINCE PORC review & acceptance is required per TS 6.14 & 1/2-ADM-1640, THEN the review is considered complete per Regulatory Applicability Determination RAD-06-03831 and RAD-06-01658. As previously noted, these procedure changes implement Corrective Actions per CR05-01169-16 and CR06-04908-04.

8.2.22.2.3 <u>Procedure 1/2-ODC-3.03, Rev 4</u>: Updating the alarm setpoints is considered a procedure correction, because this merely updates the ODCM to agree with previously approved documents that were implemented with TS Amendments. <u>SINCE</u> the change merely updates the ODCM, <u>THEN</u> the change will maintain the level of radioactive effluent control required by 10 CFR 20.1302, 40 CFR Part 190, 10 CFR 50.36a, and Appendix I to 10 CFR 50. Also, the change will not impact the accuracy or reliability of effluent dose or alarm setpoint calculation. <u>SINCE</u> PORC review & acceptance is required per TS 6.14 & 1/2-ADM-1640, <u>THEN</u> the review is considered complete per Regulatory Applicability Determination RAD-06-03831 and RAD-06-01658. As previously noted, these procedure changes implement Corrective Actions per CR06-04908-03.

8.2.23 Change (23) of BV-1 and 2 ODCM (Effective December 2006)

8.2.23.1 A description of the changes implemented with this revision are as follows:

8.2.23.1.1 Procedure 1/2-ODC-1.01, Rev 5: Changed Attachment C, Table F: 3a of the procedure matrix to add Form 1/2-ENV-01.04.F01 as documentation for performing a Channel Functional Test of the Unit 1 Primary and Alternate Gaseous Effluent Sampler Flowrate Measuring Devices per CR04-09895. Attachment C Tables were also changed to denote transition of ODCM Channel Checks from Operations (L5 Logs) to Nuclear Environmental & Chemistry (Form 1/2-ADM-0606.F01 & F02) per CR05-01422. Also, per Improved Technical Specifications (ITS), changed Attachment C Tables to reflect change in term from CHANNEL FUNCTIONAL TEST to CHANNEL OPERATIONAL TEST (COT), and added step 4.1.2 to identify requirements for ODCM changes record review and retention requirements. Revised step 5.3 to require ODCM changes be reviewed and accepted by PORC per CR05-03306.

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8.2.23.1.2	Procedure 1/2 ODC 201 Per 5: Period	the alarm coto	sints of DSWS
0.2.23.1.2	Procedure 1/2-ODC-2.01, Rev 5: Revised	-	-
···	RQ101] via vendor calculation Package N changes reflect the Extended Power Uprat		-
	0441, Unit 2 TS Amendment No. 156 and	• •	•
	0441, Ohn 2 13 Amendment No. 150 and	CI(00-0470-0	1.
8.2.23.1.3	Procedure 1/2-ODC-2.03, Rev 1: Updated	the existing R	EMP sampling
	locations with the most recent survey resu		
· · ·	Global Positioning System per CR05-0139	90-02.	U
8.2.23.1.4	Procedure 1/2-ODC-3.02, Rev 2: Changed		
	Radiation Protection Section to the Nuclea	IT Environment	ai & Unemistry
	Section per CR05-01169-20.		
8.2.23.1.5	Procedure 1/2-ODC-2.03, Rev 1, Procedure	re 1/2-ODC-2.0	04. Rev 1 and
	Procedure 1/2-ODC-3.01, Rev 1: Changed		
	Radiation Protection Section to the Nuclea		-
3 4	Section per CR05-01169-17, CR05-01169		•
8.2.23.2 The	justifications used for change (23) of the OI	DCM are as fol	lows
0.2.23.2 IIK			
8.2.23.2.1	Procedure 1/2-ODC-1.01, Rev 5: Changin	-	
	procedure matrix to add Form 1/2-ENV-0		
	performing the Channel Functional Test o		
	Gaseous Effluent Sampler Flowrate Measure procedure correction, because no Acceptation		
•	Transition of ODCM Channel Checks from		
	Environmental & Chemistry (Form 1/2-A)	- , ·	•
	considered a procedure correction, because		,
:	altered. <u>SINCE</u> these changes merely corr	•	
	the changes will maintain the level of radi		
	10 CFR 20.1302, 40 CFR Part 190, 10 CF		
· · · ·	CFR 50. Also, the change will not impact		
	effluent dose or alarm setpoint calculation	-	÷
	procedure changes implement Corrective		
	01422 and CR05-03306.	-	
·			
· · ·			

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· ·	8.2.23.2.2	Procedure 1/2-ODC-2.01, Rev 5: Updating the a procedure correction, because this merely to previously approved documents that were im Amendments. <u>SINCE</u> the change merely upde change will maintain the level of radioactive CFR 20.1302, 40 CFR Part 190, 10 CFR 50. 50. Also, the change will not impact the accu- dose or alarm setpoint calculation. <u>SINCE</u> P required per TS 6.14 & 1/2-ADM-1640, <u>THE</u> complete per Regulatory Applicability Determ previously noted, these procedure changes im	pdates the C plemented v lates the OE effluent cor 36a, and Ap uracy or reli ORC review EN the revie mination RA	points is considered DDCM to agree with with TS DCM, <u>THEN</u> the atrol required by 10 pendix I to 10 CFR ability of effluent w & acceptance is w is considered AD-06-04585. As
	8.2.23.2.3	CR06-6476-01. <u>Procedure 1/2-ODC-2.03, Rev 1</u> : Updating th	ne evicting F	FMP sampling
	0.4.43.4.3	locations with the most recent survey results Global Positioning System is considered a pr change provides more accurate distances to e locations, <u>THEN</u> the change will maintain th control required by 10 CFR 20.1302, 40 CFR	that were per ocedure con xisting REN e level of rat Part 190, 1	erformed using a rection. <u>SINCE</u> the <i>AP</i> sampling dioactive effluent 0 CFR 50.36a, and
	:	Appendix I to 10 CFR 50. Also, the change reliability of effluent dose or alarm setpoint c change implements Corrective Actions per C 01390-02.	alculation.	The procedure
	8.2.23.2.4	Procedure 1/2-ODC-2.03, Rev 1, Procedure 1/2-ODC-3.01, Rev 1; Changing of from Radiation Protection to Nuclear Environ considered a procedure correction. <u>SINCE</u> th RETS, REMP and ODCM responsibilities to change will maintain the level of radioactive CEP 20, 1202, 40 CEP Part 100, 10 CEP 50.	wnership of nmental & C ne changes n a different effluent con	f these procedures Chemistry is nerely transfers manager, <u>THEN</u> the atrol required by 10
		CFR 20.1302, 40 CFR Part 190, 10 CFR 50. 50. Also, the change will not impact the accu dose or alarm setpoint calculation. These pro Corrective Actions per CR05-01169-17, CR0 19.	uracy or reliancedure char	ability of effluent nges implement
		- END -		· · · ,

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LIQUID	EFFLUENTS Included in Procedure 1/2-ODC-2.01			
1.1 - 1a	BV-1 Liquid Source Term			
1.1-1b	BV-2 Liquid Source Term		· · ·	
1.2-1a	BV-1 Recirculation Times Required Before Sampling	Of Liquid Disc	harge Tanks	
1.2 - 1b	BV-2 Recirculation Times Required Before Sampling (Of Liquid Disc	harge Tanks	
1.3-1	$A_{i\tau}$ Values For An Adult For The Beaver Valley Site			
GASEO	US EFFLUENTS Included in Procedure 1/2-ODC-2.02			
2.1 - 1a	BV-1 Radionuclide Mix For Gaseous Effluents			
2.1-1b	BV-2 Radionuclide Mix For Gaseous Effluents			
2.1 - 2a	BV-1 Monitor Detector Efficiencies			
2.1 - 2b	BV-2 Monitor Detector Efficiencies			
2.2-1	Modes Of Gaseous Release From Beaver Valley Site V 20 And 10 CFR 50	ents For Imple	mentation Of 10 CFF	
2.2-2a	BV-1 Radionuclide Mix For Gaseous Effluents			
2.2-2b	BV-2 Radionuclide Mix For Gaseous Effluents			
2.2-3	Distances Of Limiting Maximum Individual Receptors Values	To Release Po	ints For Annual χ/Q	
ANNUA	AL AVERAGE χ/Q Included in Procedure 1/2-ODC-2.02			
2.2-4	BV-1 And 2 Containment Vents (Ground Release)			
2.2-5	BV-1 And 2 Ventilation Vents (Ground Release)			
2.2-6	BV-1 And 2 Process Vent (Elevated Release)			
2.2-7	BV-1 And 2 Turbine Building Vents (Ground Release)			
2.2-8	BV-2 Decontamination Building Vent (Ground Release	e)		

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	Page 2 of 6 LIST OF ODCM TABLES				
2.2-9	BV-2 Waste Gas Storage Vault Vent (Ground Release)				
2.2-10	BV-2 Condensate Polishing Building (Ground Release)	· .			
NOBLE	GAS DOSE FACTORS AND DOSE PARAMETERS Incl	uded in 1/2-0	DDC-2.02	×.	
2.2-11	Dose Factors For Noble Gases And Daughters				
2.2-12	Dose Parameters For Finite Elevated Plumes, Beaver Val	lley Site	· · ·		
<u> P&I DO</u>	SE PARAMETERS Included in 1/2-ODC-2.02				
2.2-13	Pit Values For A Child For The Beaver Valley Site		;		
MODES	OF GASEOUS RELEASES Included in Procedure 1/2-OD	<u>0C-2.02</u>			
2.3-1	Modes Of Gaseous Release From The Beaver Valley Site CFR 20 And 10 CFR 50	e Vents For I	mplementa	tion Of 10	
<u> P&I OR</u>	GAN DOSE FACTORS Included in 1/2-ODC-2.02			·	
2.3-2	R Values for Inhalation - Adult				
2.3-3	R Values for Inhalation - Teen	•			
2.3-4	R Values for Inhalation - Child	•			
2.3-5					
	R Values for Inhalation - Infant	· ·			
2.3-6	R Values for Inhalation - Infant R Values for Ground	· · ·	·.		
2.3-6 2.3-7		· · · · · ·	· 		
	R Values for Ground				
2.3-7	R Values for Ground R Values for Vegetation - Adult				
2.3-7 2.3-8	R Values for Ground R Values for Vegetation - Adult R Values for Vegetation - Teen				
2.3-7 2.3-8 2.3-9	R Values for Ground R Values for Vegetation - Adult R Values for Vegetation - Teen R Values for Vegetation - Child				
2.3-7 2.3-8 2.3-9 2.3-10	R Values for Ground R Values for Vegetation - Adult R Values for Vegetation - Teen R Values for Vegetation - Child R Values for Meat - Adult				
2.3-7 2.3-8 2.3-9 2.3-10 2.3-11	R Values for Ground R Values for Vegetation - Adult R Values for Vegetation - Teen R Values for Vegetation - Child R Values for Meat - Adult R Values for Meat - Teen				

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2.3-15	R Values for Cow Milk - Child		
2.3-16	R Values for Cow Milk - Infant		
2.3-17	R Values for Goat Milk - Adult		
2.3-18	R Values for Goat Milk - Teen		
2.3-19	R Values for Goat Milk - Child		
2.3-20	R Values for Goat Milk - Infant		
CONTIN	NUOUS RELEASE DEPOSITION PARAMETERS (0-5 M	(iles)Included ir	Procedure 1/2-ODC-2.02
2.3-21	BV-1 And 2 Process Vent (Elevated Release)		
2.3-22	BV-1 And 2 Containment Vents (Ground Release)		
2.3-23	BV-1 And 2 Ventilation Vents (Ground Release)		
2.3-24	BV-1 And 2 Turbine Building Vents (Ground Release)		
2.3-25	BV-2 Condensate Polishing Building (Ground Release)		
2.3-26	BV-2 Decontamination Building Vent (Ground Release))	
2.3-27	BV-2 Waste Gas Storage Vault Vent (Ground Release)		
	NUOUS RELEASE DEPOSITION PARAMETERS (SP. re 1/2-ODC-2.02	ECIAL DIST	ANCES) Included in
2.3-28	BV-1 And 2 Process Vent (Elevated Release)		
2.3-29	BV-1 And 2 Containment Vents (Ground Release)		
2.3-30	BV-1 And 2 Ventilation Vents (Ground Release)		
2.3-31	BV-1 And 2 Turbine Building Vents (Ground Release)		
2.3-32	BV-2 Condensate Polishing Building (Ground Release)		
2.3-33	BV-2 Decontamination Building Vent (Ground Release))	
2.3-34	BV-2 Waste Gas Storage Vault Vent (Ground Release)		1
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BATCH R ODC-2.02	ELEASE DISPERSION PARAMETERS (Special Distant	nces) Include	d in Procedure 1/2-		
2.3-35	BV-1 And 2 Containment Vents (Ground Release)				
2.3-36	BV-1 And 2 Ventilation Vents (Ground Release)				
2.3-37	BV-1 And 2 Process Vent (Elevated Release)				
BATCH R	ELEASE DISPERSION PARAMETERS (0-5 Miles) Inc	luded in Proc	edure 1/2-ODC-2.0		
2.3-38	BV-1 And 2 Process Vent (Elevated Release)				
ENVIRON	MENTAL MONITORING Included in Procedure 1/2-OI	<u>DC-2.03</u>			
3.0-1	Radiological Environmental Monitoring Program				
DISPERS	ON CALCULATION Included in Procedure 1/2-ODC-3.	<u>01</u>			
A:1	BV-1 And 2 Release Conditions				
INPUTS 1	O COMPUTER CODES Included in Procedure 1/2-ODC	<u>-3.01</u>			
B:1a	Inputs To GALE Code For Generation Of BV-1 Liquid	Source Term	Mixes		
B:1b	Inputs To SWEC LIQ1BB Code For Generation Of BV	2 Liquid Sou	rce Term Mixes		
B:2a	Inputs To SWEC GAS1BB Code For Generation Of BV	-1 Gaseous S	Source Term Mixes		
B:2b	Inputs To SWEC GAS1BB Code For Generation of BV	-2 Gaseous S	ource Term Mixes		
ODCM C	ONTROLS Included in Procedure 1/2-ODC-3.03	•	· ·		
C:1.1	Operational Modes	•	: •		
C:1.2	Frequency Notation	• •			
C:3.3-6	Radiation Monitoring Instrumentation	: •			
C:4.3-3	Radiation Monitoring Instrumentation Surveillance Req	uirements	n an an an Arran an A Arran an Arran an Arr		
C:3.3-12	Radioactive Liquid Effluent Monitoring Instrumentation	l			
C:4.3-12	Radioactive Liquid Effluent Monitoring Instrumentation	Surveillance	Requirements		
C:3.3-13	Radioactive Gaseous Effluent Monitoring Instrumentation	n ·			

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<u></u>	ATTACHMENT A	· I <u>_</u>		
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C:4.3-13	Radioactive Gaseous Effluent Monitoring Instrumenta	tion Surveillar	nce Requirements	
C:4.11-1	Radioactive Liquid Waste Sampling And Analysis Pro	gram	:	
C:4.11-2	Radioactive Gaseous Waste Sampling And Analysis P	rogram		
C:3.12-1	Radiological Environmental Monitoring Program			
C:3.12-2	Reporting Levels For Radioactivity Concentrations In	Environmenta	l Samples	
C:4.12-1	Maximum Values For The Lower Limits Of Detection	(LLD)		
<u>FORMAT</u>	FOR ANNUAL REPORT Included in Procedure 1/2-0	DC-3.03		
E:6.9-1	Environmental Radiological Monitoring Program Sum	mary		
ODCM C	ONTROLS PROCEDURE MATRIX Included in Proced	ure 1/2-ODC-	<u>1.01</u>	
F:la	BV-1 Radiation Monitoring Instrumentation Surveilla	nce	· · · ·	
F:1b	BV-2 Radiation Monitoring Instrumentation Surveillar	nce		
F:2a	BV-1 Liquid Effluent Monitor Surveillances			
F:2b	BV-2 Liquid Effluent Monitor Surveillances			
F:3a	BV-1 Gaseous Effluent Monitor Surveillances			
F:3b	BV-2 Gaseous Effluent Monitor Surveillances			
F:4	BV-1 and 2 Liquid Effluent Concentration Surveillance	es		
F:5	BV-1 and 2 Liquid Effluent Dose Surveillances			
F:6	BV-1 and 2 Liquid Effluent Treatment Surveillances			
F:7	BV-1 and 2 Liquid Storage Tank Activity Limit Surve	illances		
F:8	BV-1 and 2 Gaseous Effluent Dose Surveillances			
F:9	BV-1 and 2 Gaseous Effluent Air Dose Surveillances			
F:10	BV-1 and 2 Gaseous Effluent Particulate and Iodine D	ose Surveillan	ces	
F:11	BV-1 and 2 Gaseous Effluent Treatment Surveillances			

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F:12a	BV-1 Gaseous Storage Tank Activity Limit Surveillanc	es	
F:12a	BV-2 Gaseous Storage Tank Activity Limit Surveillanc	es	
F:13	BV-1 and 2 Total Dose Surveillances	· . · ·	
F:14	BV-1 and 2 REMP Surveillances		· · ·
F:15	BV-1 and 2 Land Use Census Surveillances		.*
F:16	BV-1 and 2 Interlaboratory Comparison Program		
		a. At	
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LIQUID E	FFLUENTS Included in Procedure 1/2-ODC-2.01		
1.4-1	BV-1 Liquid Radwaste System		
1.4-2	BV-2 Liquid Radwaste System		
1.4-3	BV-1 and 2 Liquid Effluent Release Points		
5-1	Site Boundary For Liquid Effluents		
<u>GASEOU</u>	S EFFLUENTS Included in Procedure 1/2-ODC-2.02		
2.4-1	BV-1 and 2 Gaseous Radwaste System		
2.4-2	BV-1 and 2 Gaseous Effluent Release Points		
5-1	Site Boundary For Gaseous Effluents		
RADIOLO ODC-2.03	DGICAL ENVIRONMENTAL MONITORING PROGRA	M Included i	n Procedure 1/2-
3.0-1	Air Sampling Locations		
3.0-2	TLD Locations		
3.0-3	Shoreline Sediment, Surface Water, And Drinking Wat	er Sampling I	locations
3.0-4	Milk Sampling Locations		
3.0-5	Foodcrop Sampling Locations		
	Fish Sampling Locations		

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		LS PROCEDURE MAT	RIX		
	obem contrio		10121		
				· ·	
	BV-1 RADIATION MONITORI	ING INSTRUMENTION SUR		8	
TABLE F: 1a	BV-1 KADIATION MONTOK				
	Attachment D Control 3.3.3.1: Maintain F	Radiation Monitoring Channe	ls in Table 3.	3-6 OPERABLE	
APPLICABILIT	Y: MODES 1 thru 4				
		e de la companya de l			
ODCM SR	DESCRIPTION	P	ROCEDURE		
4.3.3.1	Test Monitors at Table 4.3-3	1	the second		
	Frequency				
4.3.3.1.1	Noble Gas Effluent Monitors -	NOTE: Actions for INOP			
4.3.3.1.1.a	SPINGS Supplementary Leak Collection and	in the Operations & Rad		t Logs.	
4.3.3.1.1.8	Release System	1MSP-43.59-I: Channel Calibration Form 1/2-ADM-0606.F01: Channel Check			
	(RM-1VS-110 CH7 & CH9)	10ST-43.07: [CTS] Channel Functional Test [ITS] Channel			
		Operational Test (COT)			
4.3.3.1.1.b	Auxiliary Building Ventilation System	1MSP-43.60-I: Channel Ca	libration		
	(RM-1VS-109 CH7 & CH9)	Form 1/2-ADM-0606.F01:	Channel Che	ck	
		10ST-43.07: [CTS] Chann	el Functional	Test [ITS] COT	
4.3.3.1.1.c	Process Vent System (RM-1GW-109	1MSP-43.58-I: Channel Ca			
	CH7 & 9)	Form 1/2-ADM-0606.F01:			
		10ST-43.07: [CTS] Chann			
4.3.3.1.2	Noble Gas Steam Effluent	NOTE: Actions for INOP			
	Monitors	in the Operations & Rad			
4.3.3.1.2.ci	Atmospheric Steam Dump Valve and	1MSP-43.62-1: RM-1MS-10			
v.1.2a	Code Safety Valve Discharge	1MSP-43.63-I: RM-1MS-10			
v. 1.2a		1MSP-43.64-I: RM-1MS-10			
v. 1.2a	(RM-1MS-100A, B, C)				
v. 1.2d	(RM-1MS-100A, B, C)	Form 1/2-ADM-0606.F01:			
		10ST-43.05: [CTS] Chann	el Functional		
4.3.3.1.2.b	Auxiliary Feedwater Pump Turbine	10ST-43.05: [CTS] Chann 1MSP-43.65-I: Channel Ca	el Functional libration	Test [ITS] COT	
		10ST-43.05: [CTS] Chann	el Functional Ilibration Channel Che	Test [ITS] COT	

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BV-2 RADIATION MONITORING INSTRUMENTION SURVEILLANCES

TABLE F: 1b

<u>1/2-ODC-3.03, Attachment D Control 3.3.3.1</u>: Maintain Radiation Monitoring Channels in Table 3.3-6 OPERABLE <u>APPLICABILITY</u>: MODES 1 thru 4

ODCM SR	DESCRIPTION	PROCEDURE
4.3.3.1	Test Monitors at Table 4.3-3 Frequency	
4.3.3.1.1	Noble Gas Effluent Monitors	NOTE: Actions for INOPERABLE Monitors are documented in the Operations & Rad Effluent Shift Logs.
4.3.3.1.2. c.i.1.1.a	Supplementary Leak Collection and Release System (2HVS-RQ109C & D)	2MSP-43.33-I: Channel Calibration Form 1/2-ADM-0606.F02: Channel Check 2OST-43.08: [CTS] Channel Functional Test [ITS] COT

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	ODCM CONTRO	LS PROCEDURE MAT	RIX	
	BV-1 LIQUID EFFLU	ENT MONITOR SURVEILLAI	NCES	
TABLE F: 2a	Attachment E Control 3.3.3.9: Maintain	Liquid Effluent Monitors in Tak	10 2 2 12 01	
	Y: During Releases Through The Flow P		//e 3.3-12 Of	
0.000.00	DECODIDEION			
ODCM SR 4.3.3.9	DESCRIPTION Test Monitors at Table 4.3-12 Frequency	PF	OCEDURE	
4.3.3.9.1	Monitors Providing Alarm and	NOTE: Actions for INOPERA	BLE monitor	s are documented in t
	Automatic Termination	Operations & Rad Effluent SI	nift Logs.	
4.3.3.9.1.a	Liquid Radwaste Effluent Line	1MSP-43.18-1: Channel Calibra		
	(RM-1LW-104)	Form 1/2-ENV-05.04.F01: Sou 1/2OM-17.4A.D: Source Check		· .
		10ST-43.09: [CTS] Channel F	unctional Test	[ITS] COT
		Form 1/2-ADM-0606.F01: Char	nnel Check	
4.3.3.9.1.b	Liquid Waste Contaminated Drain Line (RM-1LW-116)	1MSP-43.23-I: Channel Calibra Form 1/2-ENV-05.04.F01: Sou		
		1/2OM-17.4A.D: Source Check	•	
	1	10ST-43.09: [CTS] Channel Fi		[ITS] COT
4.3.3.9.1.c	Auxiliary Feed Pump Bay Drain Monitor	Form 1/2-ADM-0606.F01: Char 1MSP-43.70-I: Channel Calibra		
	(RM-1DA-100)	10M-54.3 L5 Log: Source Che	ck	
		10ST-43.09: [CTS] Channel Fi		[ITS] COT
4.3.3.9.2	Monitors Providing Alarm, but Not	Form 1/2-ADM-0606.F01: Char NOTE: Actions for INOPERA		s are documented in t
	Prividing Auto Termination	Operations & Rad Effluent S	hift Logs.	
4.3.3.9.2.a	Component Cooling - Recirculation	1MSP-43.10-I: Channel Calibra		1701 00T
	Spray Hx River Water Monitor (RM-1RW-100)	10ST-43.09: [CTS] Channel Fi 10ST-43.09A: Source Check	inctional lest	[IIS] COT
		Form 1/2-ADM-0606.F01: Chai		
4.3.3.9.3	Flow Rate Measurement Devices	NOTE: Actions for INOPERA Operations & Rad Effluent St		
4.3.3.9.3a,b	Liquid Radwaste Effluent Lines	1MSP-17.05-I: Channel Calibra		1/2-214-03.04
	3a: (FR-1LW-104 for RM-1LW-104)	1MSP-17.06-I: F-LW-104-1 Ch	annel Calibrati	
	3b: (FR-1LW-103 for RM-1LW-116)	1MSP-17.07-I: F-LW-104-2 Ch 1MSP-17.08-I: F-LW-104-1 [C]		
		(3a)	oj unanner F	uncuonar rest [113] CC
		1MSP-17.09-I: F-LW-104-2 [C]	'S] Channel F	unctional Test [ITS] CC
		(3a) 1MSP-17.10-I: F-LW-103 [CTS	Channel Fur	nctional Test fITS1 COT
	· · · · · · · · · · · · · · · · · · ·	(3b)		
40000		Form 1/2-ADM-0606.F01: Char		
4.3.3.9.3.c	Cooling Tower Blowdown Line (FT-1CW-101)	1MSP-31.04-I: F-CW-101 Char 1MSP-31.05-I: F-CW-101 [CTS		
	(FT-1CW-101-1)	1MSP-31.06-I: F-CW-101-1 Ch	annel Calibrat	ion
		1MSP-31.07-I: F-CW-101-1 [C		
		10M-54.3 L5 Log: FT-CW-101 10M-54.3 L5 Log: FT-CW-101		
4.3.3.9.4	Tank Level Indicating Devices	NOTE: Actions for INOPERA		
		Operations Shift Logs	01	
4.3.3.9.4.a	Primary Water Storage Tank (LI-1PG-115A for 1BR-TK-6A)	1MSP-8.01-I: L-PG115A [CTS] 1MSP-8.03-I: L-PG115A Chann		
		10M-54.3 L5 Log: Channel Cha		
4.3.3.9.4.b	Primary Water Storage Tank	1MSP-8.02-I: L-PG-115B [CTS	Channel Fun	ctional Test [ITS] COT
	(LI-1PG-115B for 1BR-TK-6B)	1MSP-8.04-I: L-PG-115B Chan 10M-54.3 L5 Log: Channel Cho		
4.3.3.9.4.c	Steam Generator Drain Tank	1MSP-17.01-I: L-LW110 [CTS]		
	(LI-1LW-110 for 1LW-TK-7A)	1MSP-17.03-I: L-LW110 Chanr	el Calibration	
4.3.3.9.4.d	Steam Generator Drain Tank	10M-54.3 L5 Log: Channel Ch 1MSP-17.02-I: L-LW111 [CTS]		
4.J.J.J.J.4.U	1	1MSP-17.02-I. L-LW111 [C13]		
	(LI-1LW-111 for 1LW-TK-7B)	I INOF TO OHT. L-LANTIN ONAIN		

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BV-2 LIQUID EFFLUENT MONITOR SURVEILLAN	ICES	
TABLE F: 2b		

<u>1/2-ODC-3.03, Attachment E Control 3.3.3.9</u>: Maintain Liquid Effluent Monitors in Table 3.3-12 OPERABLE <u>APPLICABILITY</u>: During Releases Through The Flow Paths

ODCM SR	DESCRIPTION	PROCEDURE
4.3.3.9	Test Monitors at Table 4.3-12 Frequency	
4.3.3.9.1	Monitors Providing Alarm and Automatic Termination	NOTE: Actions for INOPERABLE monitors are documented in the Operations & Rad Effluent Shift Logs.
4.3.3.9.1.a	Liquid Waste Process Effluent Monitor (2SGC-RQ100)	Form 1/2-ADM-0606.F02: Channel Check Form 1/2-ENV-05.04.F01: Source Check 2MSP-43.39-I: Channel Calibration 1/2OM-17.4A.C: Source Check 2OM-25.4.L: Source Check 2OM-25.4.N: Source Check 2OST-43.03: [CTS] Channel Functional Test [ITS] COT
4.3.3.9.2	Flow Rate Measurement Devices	NOTE: Actions for INOPERABLE monitors are documented in the Operations & Rad Effluent Shift Logs and 1/2-ENV- 05.04
4.3.3.9.2.a	Liquid Radwaste Effluent (2SGC-FIS100)	2MSP-25.01-I: 2SGC-P26A,B Ch Cal & [CTS] Ch Functional Test [ITS] COT 2MSP-43.39-I: Channel Calibration Form 1/2-ADM-0606.F02: Channel Check
4.3.3.9.2.b	Cooling Tower Blowdown Line (2CWS-FT101)	2MSP-31.04-I: Channel Calibration 2MSP-31.05-I: [CTS] Channel Functional Test [ITS] COT Form 1/2-ADM-0606.F02: Channel Check

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	ODCM CONTRO	LS PROCEDURE MA	TRIX	
	BV-1 GASEOUS EFFL	UENT MONITOR SURVEIL	LANCES	
TABLE F: 3a				
	Attachment F Control 3.3.3.10: Maintain (: During Releases Through The Flow P		in Table 3.3-1	3 OPERABLE
ODCM SR	DESCRIPTION	T	PROCEDURE	· · · · · · · · · · · · · · · · · · · ·
4.3.3.10	Test Monitors at Table 4.3-13 Frequency			
4.3.3.10.1	Gaseous Waste / Process Vent	NOTE: Actions for INO		
	System	in the Operations & Rac 05.05	I Effluent Shi	t Logs and 1/2-ENV-
4.3.3.10.1.a	Noble Gas Activity Monitor	1MSP-43.22-I: Channel C 1OM-19.4.E, H: Channel		
	Pri: (RM-1GW-108B) Alt: (RM-1GW-109 Ch 5): for	10M-19.4.E, H: Channel		Release)
1	continuous releases only, not	1/2-OM-19.4A.D: Source		
	an alternate for batch releases	1/2-OM-19.4A.D: Channe 10ST-43.09: [CTS] Chan		
		Form 1/2-ADM-0606.F01		
4.3.3.10.1.b	Particulate & Iodine Sampler	Form 1/2-ADM-0606.F01	: Channel Che	ck
	Pri: Filter Paper and Charcoal Cartridge for (RM-1GW-109)			
	Alt: Filter Paper and Charcoal			
4.3.3.10.1.c	Cartridge for (RM-1GW-110) System Effluent Flow Rate	1MSP-19.05-I: [CTS] Cha	anal Eurotian	al Test fitsi COT
4.5.5.10.1.0	Measuring Device	1MSP-19.06-I: Channel C		
	Pri: (FR-1GW-108)	Form 1/2-ADM-0606.F01	: Channel Che	ck
4.3.3.10.1.d	Alt: (RM-1GW-109 Ch 10) Sampler Flow Rate Measuring	1MSP-43.21-I: Channel C	Calibration	
	Device	Form 1/2-ENV-01.04.F01	: [CTS] Chanr	nel Functional Test
	Pri: (RM-1GW-109 Ch 15) Alt: (Rotometer: FM-1GW-101 and	[ITS] COT Form 1/2-ADM-0606.F01	· Channel Che	ck
	Vacuum Gauge: PI-1GW-135			
4.3.3.10.2	for RM-1GW-110) Auxiliary Building Ventilation	NOTE: Actions for INO		nitors are documented
4.3.3.10.2	System (Ventilation Vent)	in the Operations & Rad 05.05	l Effluent Shif	
4.3.3.10.2.a	Noble Gas Activity Monitor Pri: (RM-1VS-101B)	1MSP-43.13-I: Channel C 1OST-43.07A: RM-1VS-1		nnel Eurotional Test
	Alt: (RM-1VS-101B)	[ITS] COT	os foriol cua	
		10ST-43.09: [CTS] Chan		Test [ITS] COT
		10ST-43.09A: Source Ch Form 1/2-ADM-0606.F01		ck .
4.3.3.10.2.b	Particulate & Iodine Sampler	Form 1/2-ADM-0606.F01		
	Pri: Filter Paper and Charcoal			
	Cartridge for (RM-1VS-109) Alt: Filter Paper and Charcoal			
	Cartridge for (RM-1VS-111)			
4.3.3.10.2.c	System Effluent Flow Rate	1MSP-44.07-I: [CTS] Cha		al Test [ITS] COT
	Measuring Device Pri: (FR-1VS-101)	1MSP-44.08-1: Channel C Form 1/2-ADM-0606.F01		ck
1	Alt: (RM-1VS-109 Ch 10)			

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	ODCM CONTRO	LS PROCEDURE MA	IKIA		
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	Attachment F Control 3.3.3.10: Maintain (: During Releases Through The Flow P		n Table 3.3-1	3 OPERABLE	
ODCM SR	DESCRIPTION	F	ROCEDURE		
4.3.3.10.2.d	Sampler Flow Rate Measuring	1MSP-44.07-I: Channel Fi	unctional Test		
	-Device Pri: (RM-1VS-109 Ch 15)	1MSP-44.08-1: Channel C		of Eurotional Test	
	Alt: (Rotometer: FM-1VS-102 and	Form 1/2-ENV-01.04.F01: [ITS] COT			
	Vacuum Gauge: PI-1VS-659 for RM-1VS-111)	Form 1/2-ADM-0606.F01: Channel Check			
4.3.3.10.3	Rx Containment / SLCRS (Elevated Release)	NOTE: Actions for INOPERABLE monitors are documented in the Operations & Rad Effluent Shift Logs and 1/2-ENV-			
4.3.3.10.3.a	Noble Gas Activity Monitor	05.05 1MSP-43.20-I: Channel C	alibration		
,	Pri: (RM-1VS-107B)	10M-54.3 L5 Log: RM-1V	S-107B Chani		
	Alt: (RM-1VS-110 Ch 5)	10ST-43.07A: RM-1VS-1	10 [CTS] Chai	nnel Functional Test	
		[ITS] COT 10ST-43.09: [CTS] Chan	nel Eurotional	Test IITSI COT	
		10ST-43.09A: Source Chi			
		Form 1/2-ADM-0606.F01:	Channel Che		
4.3.3.10.3.b	Particulate & Iodine Sampler	Form 1/2-ADM-0606.F01:	Channel Che	ck	
	Pri: Filter Paper and Charcoal Cartridge for (RM-1VS-110)	ŕ			
	Alt: Filter Paper and Charcoal				
100100	Cartridge for (RM-1VS-112)		- 81 8		
4.3.3.10.3.c	System Effluent Flow Rate Measuring Device	1MSP-44.09-I: Channel C 1MSP-44.10-I: [CTS] Cha		al Test IITSI COT	
· · ·	Pri: (FR-1VS-112)	Form 1/2-ADM-0606.F01:			
	Alt: (RM-1VS-110 Ch 10)			· ·	
4.3.3.10.3.d	Sampler Flow Rate Measuring	1MSP-43.19-I: Channel C			
	Device Pri: (RM-1VS-110 Ch 15)	Form 1/2-ENV-01.04.F01: [ITS] COT	[CIS] Chann	ei Functional Test	
	Alt: (Rotometer: FM-1VS-103 and	Form 1/2-ADM-0606.F01:	Channel Che	ck	
	Vacuum Gauge: PI-1VS-660 for RM-1VS-112)			•	
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		Communed		
TABLE F: 3b				
	Attachment F Control 3.3.3.10: Maintai		Table 3.3-1	3 OPERABLE
APPLICABILIT	: During Releases Through The Flow	Pains	90.0° 4	· · · · ·
ODCM SR	DESCRIPTION	PR	OCEDURE	
4.3.3.10	_Test Monitors at Table 4.3-13			
4 0 0 40 4	Frequency			
4.3.3.10.1	SLCRS Unfiltered Pathway (Ventilation Vent)	NOTE: Actions for INOPER in the Operations & Rad Eff		
				LUgs and 1/2-Civy-
4.3.3.10.1.a	Noble Gas Activity Monitor	2MSP-43.36-I: Channel Calib		
	Pri: (2HVS-RQ101B)	20ST-43.09: [CTS] Channel Functional Test [ITS] COT		
		Form 1/2-ADM-0606.F02: Ch 2-ENV-05-21: Source Check		
4.3.3.10.1.b	Particulate & lodine Sampler	Form 1/2-ADM-0606.F02: Ch		
	Pri: Filter Paper and Charcoal		· · · · · · · · · · · · · · · · · · ·	
4.3.3.10.1.c	Cartridge for (2HVS-RQ101A) Process Flow Rate Monitor	2MSP-43.36-1: Channel Calib	ration	
4.3.3.10.1.0	Pri: (Monitor Item 29 for 2HVS-	2MSP-43.36A-I: [CTS] Channel		al Test fITS1 COT
	VP101)	Work Request: Channel Calib	pration (Velo	city Probe)
4.3.3.10.1.d	Complex Flow Date Manitor	Form 1/2-ADM-0606.F02: Ch		<
4.3.3.10.1.0	Sampler Flow Rate Monitor Pri: (2HVS-FIT101-1)	2MSP-43.36-I: Channel Calib 2MSP-43.36A-I: [CTS] Chann		al Test (ITS) COT
		Form 1/2-ADM-0606.F02: Ch		
4.3.3.10.2	SLCRS Filtered Pathway	NOTE: Actions for INOPER		
	(Elevated Release)	in the Operations & Rad Eff 05.05	luent Shift	Logs and 1/2-ENV-
4.3.3.10.2.a	Noble Gas Activity Monitor	2MSP-43.32-I: 2HVS-RQ109/	A Channel C	Calibration
10.0.10.2.0	Pri: (2HVS-RQ109B)	2MSP-43.33-I: 2HVS-RQ109I	B,C,D Chani	nel Calibration
		20ST-43.08: [CTS] Channel		
		Form 1/2-ADM-0606.F02: Ch. 2-ENV-05-21: Source Check		
4.3.3.10.2.b	Particulate & Iodine Sampler	1/2-ADM-1611.F04: Channel		
	Pri: Filter Paper and Charcoal			
4.3.3.10.2.c	Cartridge for (2HVS-RQ109A) Process Flow Rate Monitor	2MSP-43.32A-I: [CTS] Chanr	ol Eunotion	al Test //TE1 COT
4.3.3.10.2.0	Pri: (Monitor Item 29 for 2HVS-	2MSP-43.32A-I: [CTS] Chanr 2MSP-43.33-I: 2HVS-RQ109		
	FR22)	Form 1/2-ADM-0606.F02: Ch		
	1 st Alt: (2HVS-FI22A and FI22C)			
4.3.3.10.2.d	2 nd Alt: (2HVS-FI22B and FI22D) Sampler Flow Rate Monitor	2MSP-43.32-1: 2HVS-RQ109/	A Channel C	alibration
-+. U.U. 1 U.Z.U	Pri: (Monitor Items 28 & 72 for	2MSP-43.32A-I: [CTS] Chanr		
	2HVS-DAU109A)	2MSP-43.33-1: 2HVS-RQ109	3,C,D, Chan	nel Calibration
		Form 1/2-ADM-0606.F02: Ch	annel Check	<

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ABLE F: 3b	Attachment F Control 3.3.3.10: Maintai	n Gaseous Effluent Monitors in	Table 3.3-1	3 OPERABLE	
	: During Releases Through The Flow I				
ODCM SR	DESCRIPTION	PR	CEDURE		
4.3.3.10.3 -	Decontamination Building	NOTE: Actions for INOPER	ABLE mon		
	Vent	in the Operations & Rad Eff 05.05	luent Shift	Logs and 1/2-ENV-	
4.3.3.10.3.a	Noble Gas Activity Monitor	2MSP-43.35-I: Channel Calib		<u></u>	
	Pri: (2RMQ-RQ301B)	20ST-43.09: [CTS] Channel Functional Test [ITS] COT 2-ENV-05-21: Source Check (DRMS Auto Function)			
		Form 1/2-ADM-0606.F02: Ch			
4.3.3.10.3.b	Particulate & Iodine Sampler	Form 1/2-ADM-0606.F02: Ch	annel Checl	<	
	Pri: Filter Paper and Charcoal Cartridge for (2RMQ-RQ301A)				
4.3.3.10.3.d	Sampler Flow Rate Monitor	2MSP-43.35-I: Channel Calib			
	Pri: (2RMQ-FIT301-1)	2MSP-43.35A-I: [CTS] Chann Form 1/2-ADM-0606.F02: Cha			
4.3.3.10.4	Condensate Polishing	NOTE: Actions for INOPERABLE monitors are documented			
	Building Vent	in the Operations & Rad Eff 05.05	luent Shift	Logs and 1/2-ENV-	
4.3.3.10.4.a	Noble Gas Activity Monitor	2MSP-43.38-I: Channel Calib			
	Pri: (2HVL-RQ112B)	2OST 2.43.09: [CTS] Channe Form 1/2-ADM-0606.F02: Cha			
		2-ENV-05-21: Source Check			
4.3.3.10.4.b	Particulate & Iodine Sampler	Form 1/2-ADM-0606.F02: Ch	annel Checl	κ	
	Pri: Filter Paper and Charcoal Cartridge for (2HVL-RQ112A)	·			
4.3.3.10.4.d	Sampler Flow Rate Monitor	2MSP-43.38-I: Channel Calibration 2MSP-43.38A-I: [CTS] Channel Functional Test [ITS] COT			
	Pri: (2HVL-FIT112-1)	Form 1/2-ADM-0606.F02: Chan			
4.3.3.10.5	Waste Gas Storage Vault Vent	NOTE: Actions for INOPER	ABLE mon	itors are documented	
		in the Operations & Rad Eff 05.05	uent Shift	Logs and 1/2-ENV-	
4.3.3.10.5.a	Noble Gas Activity Monitor	2MSP-43.37-I: Channel Calib			
	Pri: (2RMQ-RQ303B)	2OST-43.09: [CTS] Channel Form 1/2-ADM-0606.F02; Cha			
		2-ENV-05-21: Source Check	DRMS Auto		
4.3.3.10.5.b	Particulate & Iodine Sampler Pri: Filter Paper and Charcoal	1/2-ADM-1611.F04 Channel (Check		
	Cartridge for (2RMQ-RQ303A)				
4.3.3.10.5.d	Sampler Flow Rate Monitor	2MSP-43.37-I: Channel Calib			
	Pri: (2RMQ-FIT303-1)	2MSP-43.37A-I [CTS] Channe Form 1/2-ADM-0606.F02: Cha			

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TABLE F: 4						
APPLICABILITY	Attachment G Control 3.11.1.1: Maintai	In Effluent Concentration V	within 10 Times 1	UCFR20 EC's		
AFFLICADILIT	<u>I</u> . ALAIT HINES					
ODCM SR	DESCRIPTION	T	PROCEDURE			
4.11.1.1.1.A	Batch Waste Release Tanks:	CHM CP 3: Sampling an				
	Sample and Analyze Radioactive	CHM CP 5: Radiochemi	ical Procedures	·		
} • [−] [−]	Liquid Wastes per Table 4.11-1	CHM CP 8: Logs and Fo		F		
		CHM CP 9: Conduct of				
		Form 1/2-ADM-0606.F0				
		Form 1/2-ENV-05.11.F0				
		1/2-ENV-05.26: Sample		amping		
4.11.1.1.1.B	Continuous Releases:	CHM CP 3: Sampling an	nd Testing			
	Sample and Analyze Radioactive	CHM CP 5: Radiochemical Procedures				
1	Liquid Wastes per Table 4.11-1	CHM CP 8: Logs and Forms (Analysis) CHM CP 9: Conduct of Operation				
		Form 1/2-ADM-0606.F0		k Somolina		
		Form 1/2-ENV-05.01.F0				
		Form 1/2-ENV-05.11.F0				
	· · · · · · · · · · · · · · · · · · ·	1/2-ENV-05.26: Sample				
4.11.1.1.2	Use ODCM Methodology to	Form 1/2-ENV-05.04.F0				
	Assure Compliance	1/20M-17.4A.D: RWDA		<u> </u>		
4.11.1.1.3	Take Turbine Building Grab Sample When BV-1 Primary to	CHM CP 3: Sampling an CHM CP 5: Leak Rate C				
	Secondary Leakage Exceeds 0.1	CHM CP 8: Logs and Fo				
	gpm (142 gpd)	Form 1/2-ADM-0606.F0	1 & F02: Sump S	ampling		
Ĩ		Form 1/2-ENV-05.01.F0		pling		
		Form 1/2-ENV-05.04.F0		e mentio e		
		Form 1/2-ENV-05.11.F0 1/2-ENV-05.26: Sample		ampling		
4.11.1.1.4	Obtain Turbine Building Grab	CHM CP 3: Sampling ar		· · · · · · · · · · · · · · · · · · ·		
	Sample When BV-2 Primary to	CHM CP 5: Leak Rate C				
	Secondary Leakage Exceeds 0.1	CHM CP 8: Logs and Fo		1		
	gpm (142 gpd)	Form 1/2-ADM-0606.F0				
	· · · · ·	Form 1/2-ENV-05.01.F0		pling		
		Form 1/2-ENV-05.04.F0 Form 1/2-ENV-05.11.F0		ampling		
	i i i i i i i i i i i i i i i i i i i	1/2-ENV-05.26: Sample		amping		
4,11.1.1.5	Obtain Grab Samples Prior to BV-	Form 1/2-ADM-0606.F0		ampling		
1	2 Recirculation Drain Pump	Form 1/2-ENV-05.01.F0				
	Discharge to Catch Basin No. 16	20M-9.2: Rx Plant Vent	s and Drains (CB	-16)		
ļ		20M-9.4F: Drain RSS P				
		20M 51: OM Clearance		15A/B)		
I.		1/2-ENV-05.26: Sample	Analysis Wallix			

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	BV-1 AND 2 LIQUID	EFFLUENT DOSE SU	JRVEILLANCES				
	<u>, Attachment H Control 3.11.1.2</u> : Liquid <u>Y</u> : At All Times	Effluent Dose					
ODCM SR	DESCRIPTION	PROCEDURE					
4.11.1.2.1	Using the ODCM - Determine Cumulative Dose From Liquid Effluents Every 31 Days	Form 1/2-ENV-05.0 SAP Order (Issue 1 1/20M-17.4A.D: R)	NPD3NRE Letter: Mon	thly Dose Projection)			

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	ODCM CONTRO	OLS PROCEDURE MA	ATKIX			
	BV-1 AND 2 LIQUID EFF	LUENT TREATMENT SUR	VEILLANCES			
TABLE F: 6						
1/2-ODC-3.03	Attachment I Control 3.11.1.3: Liquid E	ffluent Treatment System				
APPLICABILI	TY: At All Times		· . ·			
ODCM SR	DESCRIPTION		PROCEDURE			
4.11.1.3.1	Using the ODCM - Project the Liquid Release Dose Every 31 Days	Form 1/2-ENV-05.04.F01: RWDA-L SAP Order (Issue NPD3NRE Letter: Monthly Dose Projection) 1/2OM-17.4A.D: RWDA-L				
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fitle:			Unit: 1/2	Level Of Use: General Skill Reference
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	Р	FACHMENT C Page 12 of 19 DLS PROCEDURE MAT	RIX	
	BV-1 AND 2 LIQUID STORAGE	TANK ACTIVITY LIMI	Γ SURVEI	LLANCES
TABLE F: 7 1/2-ODC-3.03	3. Attachment J Control 3.11.1.4: Maintain	Liquid Tank Activity within the	e following lin	nits:
≤10 Curies in	1BR-TK-6B 1LW-TK-7A 1LW - TK-7B	rry outside radioactive liquid st	orage tanks.	
ODCM	DESCRIPTION	PR	OCEDURE	<u> </u>
SR		•		

ile:			Unit:	1/2-ODC-1.01 Level Of Use:	
			1/2	General Skill Refer	rence
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		ge 13 of 19			
		LS PROCEDURE MA	ATRIX		
	BV-1 AND 2 GASEOUS E	EFFLUENT DOSE SURVE	EILLANCES	на стра Ма	
ABLE F: 8 /2-ODC-3.03, Att PPLICABILITY: /	<u>tachment K Control 3.11.2.1</u> : Gaseous At All Times	Effluent Dose Rates	a a th		
ODCM SR	DESCRIPTION	[PROCEDURE	· · · · · · · · · · · · · · · · · · ·	
4.11.2.1.1	Using the ODCM - Determine the	Form 1/2-ENV-05.05.F0		<u></u>	
-	Noble Gas Effluent Dose Rate	Form 1/2-ENV-01.03.F0			
		Form 1/2-ENV-05.06.F0 10M-19.4E, H: RWDA-0			
		1/20M-19.4A.B: RWDA-			
4.11.2.1.2	Sample and Analyze per Table			hway Dose	
4.11.2.1.2.A	Waste Gas Storage Tank -	CHM CP 3: Sampling an CHM CP 5: Radiochemic		· . ·	
	Grag Sample Each Tank	CHM CP 5: Radiochemic CHM CP 8: Logs and Fo		•	
		CHM CP 9: Conduct of C		:	
		Form 1/2-ADM-0606.F01	1 & F02: GW Ta		
		Form 1/2-ENV-05.02.F0		mpling	
		Form 1/2-ENV-05.05.F0 Form 1/2-ENV-05.11.F0		Sampling	
		1/2-ENV-05.26: Sample			
4.11.2.1.2.B	Containment Purge -	CHM CP 3: Sampling an	d Testing	·	
	Grag Sample Each Purge	CHM CP 5: Radiochemic		· .	
		CHM CP 8: Logs and Fo CHM CP 9: Conduct of C			
		Form 1/2-ADM-0606.F01		ink Sampling	
		Form 1/2-ENV-05.05.F0	1: RWDA-G		
		Form 1/2-HPP-3.07.003.			
		Form 1/2-ENV-05.11.F0		Sampling	
4.11.2.1.2.C	Ventilation Systems	1/2-ENV-05.26: Sample	Analysis Matrix	······	
4.11.2.1.2.C.1	BV-1 Grab and Continuous	CHM CP 3: Sampling an	d Testina	ی بر با ایک ایک ایک ایک ایک ایک ایک ایک ایک ای	
thru	Samples	CHM CP 5: Radiochemic	cal Procedures		
4.11.2.1.C.3		CHM CP 8: Logs and Fo			
and 4.11.2.1.2.D.1		CHM CP 9: Conduct of C		nk Compling	
4.11.2.1.2.0.1 thru		Form 1/2-ADM-0606.F01 Form 1/2-ENV-01.03.F0			•
4.11.2.1.2.D.3		Form 1/2-ENV-05.11.F0	1: Rad Monitor	Sampling	
		Form 1/2-ENV-05.25Fx			
		1-HPP-5.01.001; SA-9/1			
		1-HPP-5.01.002: SPING 1/2-ENV-05.26: Sample			
4.11.2.1.2.C.4	BV-2 Grab and Continuous	CHM CP 3: Sampling an		·····	<u></u>
thru	Samples	CHM CP 5: Radiochemic	cal Procedures		
4.11.2.1.2.C.8		CHM CP 8: Logs and Fo			
and 4.11.2.1.2.D.4		CHM CP 9: Conduct of C		ork Sampling	
4.11.2.1.2.D.4 thru		Form 1/2-ADM-0606.F01 Form 1/2-ENV-01.03.F0			
4.11.2.1.2.D.8		Form 1/2-ENV-05.11.F0			
		Form 1/2-ENV-05.25Fx	x: RMS & DRM	S Valve Verification	
		2-HPP-5.04.001: Emerge 1/2-ENV-05.26: Sample			

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ODCM: Index, Matrix and History of ODCM Changes

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BV-1 AND 2 GASEOUS EFFLUENT AIR DOSE SURVEILLANCES

TABLE F: 9

<u>1/2-ODC-3.03, Attachment L Control 3.11.2.2</u>: Gaseous Effluent Air Doses <u>APPLICABILITY</u>: At All Times

ODCM SR	DESCRIPTION	PROCEDURE
4.11.2.2.1	Using the ODCM - Determine the Noble Gas Cumulative Dose Contributions Every 31 Days	Form 1/2-ENV-05.05.F01: RWDA-G Form 1/2-ENV-01.03.F01: Continuous Release Permit Form 1/2-ENV-05.06.F01: Abnormal Gaseous Releases Form 1/2-ENV-05.11.F01: Rad Monitor Sampling SAP Order (Issue NPD3NRE Letter: Monthly Dose Projection)

	Beaver Valley Power	Station	Procedure N	
le:			Unit:	<u>1/2-ODC-1.01</u> Level Of Use:
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	ODCM CONTRO	OLS PROCEDURE MA	TRIX	
	BV-1 AND 2 GASEOUS EFFLUENT P	ARTICULATE AND IODINE		
ABLE F: 10				
2-ODC-3.03	Attachment M Control 3.11.2.3: Gaseou	us Effluent Particulate And lo	dine Doses	
PPLICABILI	TY: At All Times			
ODCM	DESCRIPTION		ROCEDURE	
SR		·		
4.11.2.3.1	Using the ODCM - Determine the	Form 1/2-ENV-05.05.F01:		
	Particulate & Radioiodine Cumulative Dose Contributions Every 31 Days	Form 1/2-ENV-01.03.F01: Form 1/2-ENV-05.06.F01:		
		Form 1/2-ENV-05.08.F01.7		
·	l	SAP Order (Issue NPD3NF		
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ODCM: Index, Matrix and History of ODCM Changes

Procedure Ni	imber:
	1/2-ODC-1.01
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BV-1 AND 2 GASEOUS EFFLUENT TREATMENT SURVEILLANCES

TABLE F: 11

<u>1/2-ODC-3.03, Attachment N Control 3.11.2.4</u>: Gaseous Effluent Treatment System <u>APPLICABILITY</u>: At All Times

ODCM SR	DESCRIPTION	PROCEDURE
4.11.2.4.1	U s ing the ODCM - Project the Gas Release Dose from the Site Every 31 Days	Form 1/2-ENV-05.05.F01: RWDA-G Form 1/2-ENV-01.03.F01: Continuous Release Permit Form 1/2-ENV-05.06.F01: Abnormal Gaseous Releases SAP Work Order (Issue SHP Letter for Monthly Dose Projection)

	Beaver Valley Power	Station	Procedure N	umber: 1/2-ODC-1.01
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	·····		1/2	General Skill Refere
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	ODCM CONTRO	OLS PROCEDURE N	IATRIX	
	BV-1 GASEOUS STORAGE	E TANK ACTIVITY LIMIT	SURVEILLANCE	s
TABLE F: 12 1/2-ODC-3.03	a 3. Attachment O Control 3.11.2.5: Mainta	in Gas Storage Tank Activ	vity within the follo	owing limits:
1GW-TK-1A:	<52000 Curies Noble Gas (Considered)	Ke-133)		
	<52000 Curies Noble Gas (Considered) <52000 Curies Noble Gas (Considered)			
		(6-100)		
APPLICABILI	ITY: At All Times		:	
ODCM	DESCRIPTION		PROCEDURE	
SR 4.11.2.5.1	Determine Tank Gas Contents when	Form 1/2-ENV-05.02.F0	01: GW Tank Sar	nnling
	Adding Rad Material & (RCS Activity >100uCi/ml)	10M-19.4.G: GW Dispo 1/2-ENV-05.26: Sample	osal System	
	BV-2 GASEOUS STORAGE	E TANK ACTIVITY LIMIT S	SURVEILLANCE	s
TABLE F: 12 1/2-0DC-3.03				
1/2-ODC-3.03	b	in Gas Storage Tank Activ	rity with the follow	ing limit:
<u>1/2-ODC-3.03</u> 2GWS-TK25/	b 3 <u>, Attachment O Control 3.11.2.5</u> : Mainta	in Gas Storage Tank Activ	rity with the follow	ing limit:
<u>1/2-ODC-3.03</u> 2GWS-TK25/	b <u>3. Attachment O Control 3.11.2.5</u> : Mainta A thru 25G: <u>≤</u> 19000 Curies Noble Gas (C	in Gas Storage Tank Activ	rity with the follow	ing limit:
1/2-ODC-3.03 2GWS-TK25/ APPLICABILI	b 3. Attachment O Control 3.11.2.5: Mainta A thru 25G: ≤19000 Curies Noble Gas (C ITY: At All Times DESCRIPTION Determine Gaseous Waste Tank	in Gas Storage Tank Activ onsidered Xe-133) in any Form 1/2-ENV-05.02.F0	rity with the follow connected group PROCEDURE D1: GW Tank San	ing limit: of Gas Storage Tanks npling
1/2-ODC-3.03 2GWS-TK25/ APPLICABILI	b 3 <u>, Attachment O Control 3.11.2.5</u> : Mainta A thru 25G: <u><</u> 19000 Curies Noble Gas (C I <u>TY</u> : At All Times DESCRIPTION	in Gas Storage Tank Activ considered Xe-133) in any	rity with the follow connected group PROCEDURE D1: GW Tank San tions & Limitation	ing limit: of Gas Storage Tanks npling
1/2-ODC-3.03 2GWS-TK25/ APPLICABILI	b 3. Attachment O Control 3.11.2.5: Mainta A thru 25G: <u><</u> 19000 Curies Noble Gas (C I <u>TY</u> : At All Times DESCRIPTION Determine Gaseous Waste Tank Rad Material When Adding Rad	in Gas Storage Tank Activ considered Xe-133) in any Form 1/2-ENV-05.02.F(20M-19.2: GW Precaut 20M-19.4G: GW transf 20M-54.3 L5 Log Item	vity with the follow connected group PROCEDURE D1: GW Tank San tions & Limitations er from Unit 2 133	ing limit: of Gas Storage Tanks npling
1/2-ODC-3.03 2GWS-TK25/ APPLICABILI	b 3. Attachment O Control 3.11.2.5: Mainta A thru 25G: <u><</u> 19000 Curies Noble Gas (C I <u>TY</u> : At All Times DESCRIPTION Determine Gaseous Waste Tank Rad Material When Adding Rad	in Gas Storage Tank Activ considered Xe-133) in any Form 1/2-ENV-05.02.F(2OM-19.2: GW Precaut 2OM-19.4G: GW transf	vity with the follow connected group PROCEDURE D1: GW Tank San tions & Limitations er from Unit 2 133	ing limit: of Gas Storage Tanks npling
1/2-ODC-3.03 2GWS-TK25/ APPLICABILI	b 3. Attachment O Control 3.11.2.5: Mainta A thru 25G: <u><</u> 19000 Curies Noble Gas (C I <u>TY</u> : At All Times DESCRIPTION Determine Gaseous Waste Tank Rad Material When Adding Rad	in Gas Storage Tank Activ considered Xe-133) in any Form 1/2-ENV-05.02.F(20M-19.2: GW Precaut 20M-19.4G: GW transf 20M-54.3 L5 Log Item	vity with the follow connected group PROCEDURE D1: GW Tank San tions & Limitations er from Unit 2 133	ing limit: of Gas Storage Tanks npling

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BV-1 AND 2 TOTAL DOSE SURVEILLANCES

TABLE F: 13

1/2-ODC-3.03, Attachment P Control 3.11.4.1: Liquid And Gaseous Doses APPLICABILITY: At All Times

ODCM SR	DESCRIPTION	PROCEDURE
4.11.4.1.1	Using the ODCM - Determine Cumulative Gas & Liquid Dose per Control 3.11.1.2, 3.11.2.2, 3.11.2.3	Form 1/2-ENV-01.05.F01: Annual RETS Report (40CFR190) Form 1/2-ENV-05.04.F01: RWDA-L Form 1/2-ENV-05.05.F01: RWDA-G Form 1/2-ENV-01.03.F01: Continuous Release Permit Form 1/2-ENV-05.06.F01: Abnormal Gaseous Releases 1/2-ENV-01.04: Effluent Data Logs (40CFR190)

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	BV-1 AND 2 REM	IP PROGRAM SURVEII	LANCES	
	1 <u>3, Attachment Q Control 3.12.1</u> : Radiolog <u>ITY</u> : At All Times	ical Environmental Mon	itoring Program (RE	EMP)
ODCM	DESCRIPTION		PROCEDURE	· · · · · · · · · · · · · · · · · · ·
<u>SR</u> 12.1.1	Using Locations in the ODCM -Collect and Analyze Samples per Tables 3.12-1, 3.12-2 & 4.12-1	1/2-ENV-02.01: Des 1/2-ENV-03.01: Env		
-ODC-3.0	5 <u>3. Attachment R Control 3.12.2</u> : Land Use <u>ITY</u> : At All Times	e Census		
DLICABIL	3, Attachment R Control 3,12.2: Land Use	e Census	PROCEDURE	
ODC-3.0 PLICABIL ODCM SR	3. Attachment R Control 3.12.2: Land Use ITY: At All Times	1/2-ENV-02.01: Des	cription of overall R	
ODC-3.0 PLICABIL ODCM SR	3. Attachment R Control 3.12.2: Land Use <u>ITY</u> : At All Times DESCRIPTION Using the Best Available Method - Conduct a Land Use Census Yearly	1/2-ENV-02.01: Des 1/2-ENV-4.02: Comp	cription of overall R	EMP
-ODC-3.0 PLICABIL	3. Attachment R Control 3.12.2: Land Use <u>ITY</u> : At All Times DESCRIPTION Using the Best Available Method - Conduct a Land Use Census Yearly	1/2-ENV-02.01: Des 1/2-ENV-4.02: Comp	cription of overall R	EMP
ODC-3.0 PLICABIL DDCM SR	3. Attachment R Control 3.12.2: Land Use <u>ITY</u> : At All Times DESCRIPTION Using the Best Available Method - Conduct a Land Use Census Yearly	1/2-ENV-02.01: Des 1/2-ENV-4.02: Comp	cription of overall R	EMP
ODC-3.0 PLICABIL ODCM SR 12.2.1	3. Attachment R Control 3.12.2: Land Use <u>ITY</u> : At All Times DESCRIPTION Using the Best Available Method - Conduct a Land Use Census Yearly Between 6/1 & 10/1	1/2-ENV-02.01: Des 1/2-ENV-4.02: Comp	cription of overall R	EMP
ODC-3.0 PLICABIL ODCM SR 12.2.1 BLE F: 16 -ODC-3.0	3. Attachment R Control 3.12.2: Land Use <u>ITY</u> : At All Times DESCRIPTION Using the Best Available Method - Conduct a Land Use Census Yearly Between 6/1 & 10/1	1/2-ENV-02.01: Des 1/2-ENV-4.02: Comp and b	cription of overall R pliance to ODCM C	EMP
DDC-3.0 PLICABIL DDCM SR 12.2.1 BLE F: 16 -ODC-3.0 PLICABIL	3. Attachment R Control 3.12.2: Land Use <u>ITY</u> : At All Times DESCRIPTION Using the Best Available Method - Conduct a Land Use Census Yearly Between 6/1 & 10/1 3. Attachment S Control 3.12.3: Interlabor	1/2-ENV-02.01: Des 1/2-ENV-4.02: Comp and b	cription of overall R pliance to ODCM C	EMP
DDC-3.0 PLICABIL ODCM SR 12.2.1 BLE F: 16 -ODC-3.0 PLICABIL ODCM	3. Attachment R Control 3.12.2: Land Use <u>ITY</u> : At All Times DESCRIPTION Using the Best Available Method - Conduct a Land Use Census Yearly Between 6/1 & 10/1 S 3. Attachment S Control 3.12.3: Interlabor <u>ITY</u> : At All Times	1/2-ENV-02.01: Des 1/2-ENV-4.02: Comp and b	cription of overall R oliance to ODCM Co ram PROCEDURE	EMP ontrol 3.12.2 Action a
DDC-3.0 PLICABIL DDCM SR 12.2.1 BLE F: 10 ODC-3.0 PLICABIL DDCM SR	3. Attachment R Control 3.12.2: Land Use ITY: At All Times DESCRIPTION Using the Best Available Method - Conduct a Land Use Census Yearly Between 6/1 & 10/1 S. Attachment S Control 3.12.3: Interlabor ITY: At All Times DESCRIPTION Include Analysis Results of the Interlaboratory Comparison Program in the Annual Radiological	1/2-ENV-02.01: Des 1/2-ENV-4.02: Comp and b	cription of overall R oliance to ODCM Co ram PROCEDURE	EMP ontrol 3.12.2 Action a
DDC-3.0 PLICABIL DDCM SR 12.2.1 BLE F: 10 ODC-3.0 PLICABIL DDCM SR	3. Attachment R Control 3.12.2: Land Use ITY: At All Times DESCRIPTION Using the Best Available Method - Conduct a Land Use Census Yearly Between 6/1 & 10/1 S. Attachment S Control 3.12.3: Interlabor ITY: At All Times DESCRIPTION Include Analysis Results of the Interlaboratory Comparison Program in the Annual Radiological	1/2-ENV-02.01: Des 1/2-ENV-4.02: Comp and b	cription of overall R oliance to ODCM Co ram PROCEDURE	EMP ontrol 3.12.2 Action a

Beaver Valley Power Station

Unit 1/2

1/2-ODC-2.01

ODCM: LIQUID EFFLUENTS

Document Owner Manager, Nuclear Environmental and Chemistry

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Safety Related Procedure	Yes		
Effective Date	· · ·		



Beaver Valley Power Station		Procedure Number: $1/2$ ODC 2.01			
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3.0	REF	ERENCES	S AND COMMITMENTS		
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	8.2		nce With 10 CFR 20 EC Limits (ODCM (
		8.2.1	Batch Releases		
	0.2	8.2.2	Continuous Releases.		
	8.3	-	nce With 10 CFR 50 Dose Limits (ODCM Cumulation Of Doses (ODCM CONTR		
		8.3.1 8.3.2	Projection Of Doses (ODCM CONTRO		
	8.4		adwaste System	-	
	0.4	8.4.1	BV-1 Liquid Radwaste System Compon		
		8.4.2	BV-1 Laundry and Contaminated Show	er Drain System C	omnonents
		8.4.3	BV-2 Liquid Radwaste System Compon		
ΔΤΤ	ACHI	MENT A	LIQUID SOURCE TERMS		
		MENT B			
		MENT C	RECIRCULATION TIMES INGESTION DOSE COMMITMENT F	ACTORS	
		MENT D			
		MENT E	LIQUID RADWASTE SYSTEM SITE BOUNDARY FOR LIQUID EFFI	LUENTS	
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1.0 <u>PURPOSE</u>

1.1 This procedure provides the calculational methodology to be used for determination of the following release parameters as denoted in **[CTS]** the Administrative Controls Section of the Unit 1/2 Technical Specifications **[ITS]** T.S. 5.5.2.^(3.2.1)

- 1.1.1 Liquid effluent monitor alarm setpoints ([CTS] Technical Specification 6.8.6.a, Item 1 [ITS] T.S. 5.5.2.a)
- 1.1.2 Liquid effluent release concentration calculations ([CTS] Technical Specification 6.8.6.a, Item 2 [ITS] T.S. 5.5.2.b)
- 1.1.3 Liquid effluent dose projection and cumulative dose calculations ([CTS] Technical Specification 6.8.6.a, Items 4 and 5[ITS] T.S. 5.5.2.d and T.S. 5.5.2.e)
- 1.2 This procedure also provides information related to the following:
 - 1.2.1 Liquid Radwaste Treatment System ([CTS] Technical Specification 6.8.6.a, Item 6 [ITS] T.S. 5.5.2.f)
 - 1.2.2 Site Boundary used for liquid effluents
- 1.3 Prior to issuance of this procedure, these items were contained in Section 1 of the old ODCM.

2.0 <u>SCOPE</u>

2.1 This procedure is applicable to all station personnel that are qualified to perform activities as described and referenced in this procedure.

3.0 <u>REFERENCES AND COMMITMENTS</u>

- 3.1 <u>References</u>
 - 3.1.1 References For BV-1 Liquid Effluent Monitor Setpoints
 - 3.1.1.1 Beaver Valley Power Station, Appendix I Analysis Docket No. 50-334 and 50-412; Table 2.1-3
 - 3.1.1.2 Beaver Valley Power Station, Appendix I Analysis Docket No. 50-334 and 50-412; Table 2.1-2
 - 3.1.1.3 10 CFR 20, Appendix B, (20.1001-20.2402) Table 2, Column 2 EC's
 - 3.1.1.4 Calculation Package No. ERS-SFL-92-039, Isotopic Efficiencies For Unit 1 Liquid Process Monitors

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e:		Unit:	1/2-ODC-2.01 Level Of Use:	
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3.1.1.6	Stone and Webster Calculation Package No. UR(I Releases and Concentrations - Expect and Design	, ,	4	
3.1.2 Ref	erences for BV-2 Liquid Effluent Monitor Setpoints	· .	· ·	
3.1.2.1	10 CFR 20, Appendix B, (20.1001-20.2402) Table	e 2, Column 2	2 EC's	
3.1.2.2 -	Calculation Package No. ERS-SFL-86-026, Unit 2	2 DRMS Isot	opic Efficiencies	
3.1.2.3	Stone and Webster Computer Code LIQ1BB; "No Pressurized Water Reactor"	rmal Liquid I	Releases From A	
3.1.2.4	Calculation Package No. ERS-JWW-87-015, Isoto RQ100	opic Efficienc	cies For 2SGC-	
3.1.2.4	.1 The Isotopic Efficiencies for 2SGC-RQ100 presented in Calculation Package No. ERS-S	-	ed by the values	
3.1.2.5	Calculation Package No. ERS-WFW-87-021, Con	version Facto	or for 2SGC-RQ100	
3.1.2.5	.1 The Monitor Conversion Factor (CF ₁₁) for 2 the value presented in Calculation Package 1	-		
3.1.2.6	Calculation Package No. ERS-ATL-93-021, Proce Effluent Monitors	ess Alarm Set	points For Liquid	
3.1.2.7	Stone and Webster Calculation Package No. UR(E Releases and Concentrations - Expect and Design		-	
3.1.3 Ref	erences used for Other Portions of this procedure			
3.1.3.1	NUREG-0133, Preparation of Radiological Efflue Nuclear Power Plants	nt Technical	Specifications for	
3.1.3.2	NUREG-1301, Offsite Dose Calculation Manual C Effluent Controls for Pressurized Water Reactors Supplement No. 1)		. –	
3.1.3.3	NUREG-0017; Calculation of Releases of Radioac Liquid Effluents from PWR's, Revision 0	ctive Materia	ls in Gaseous and	
3.1.3.4	Regulatory Guide 1.113; Estimating Aquatic Disp. Accidental and Routine Reactor Releases for the P Appendix I, April 1977			

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3	.1.3.5	Regulatory Guide 1.109; Calculation of Annual Dose Releases of Reactor Effluents for the Purpose of Eval Part 50, Appendix I	s to Man			
3.	.1.3.6	Calculation Package No. ERS-ATL-83-027; Liquid V for HPM-RP 6.5, Issue 3 and Later	Vaste Dos	e Factor Calculation		
3.	.1.3.7	NUREG-0172; Age-Specific Radiation Dose Commit Chronic Intake	tment Fac	tors for a One-Year		
3.	.1.3.8 -	UCRL-50564; Concentration Factors of Chemical Ele Organisms, Revision 1, 1972	ements in	Edible Aquatic		
3.	1.3.9	1/2-ADM-1640, Control of the Offsite Dose Calculat	ion Manu	al		
3.	1.3.10	1/2-ADM-0100, Procedure Writers Guide				
3.	1.3.11	NOP-SS-3001, Procedure Review and Approval				
3.	1.3.12	1/2-ODC-3.03, ODCM: Controls for RETS and REMP Programs				
3.	1.3.13	CR 02-06174, Tracking of Activities for Unit 1 RCS Zinc Addition Implementation. CA-014, Revise ODCM Procedure 1/2-ODC-2.01 (Tables 1.1-1a and 1b) to include the addition of Zn-65 to the ODCM liquid source term.				
3.	1.3.14	CR 03-02466, RFA-Radiation Protection Effluent Co Recommendation on Processing when Performing We 7A/7B]. CA-02, Revise ODCM Procedure 1/2-ODC- show the liquid waste flow path cross-connect betwee	eekly Sam 2.01, (Att	ple of [1LW-TK- tachment D) to		
3.	1.3.15	CR 05-03306, Incorporated Improved Technical Spec	ifications	(ITS).		
3.	.1.3.16	CR 05-03854, ODCM Figure for Liquid Effluent Release Points Need Updated. CA-01, revise ODCM procedure 1/2-ODC-2.01 (ODCM: Liquid Effluents) Attachment D, Figure 1.4-3 to incorporate a modified version of Plant Drawing No. 8700-RM-27F.				
3.	1.3.17	Unit 1 Technical Specification Amendment No. 275 (LAR 1A-302) to License No. DPR-66. This amendment to the Unit 1 license was approved by the NRC on July 19, 2006.				
3.	1.3.18	Vendor Calculation Package No. 8700-UR(B)-223, In Containment Conversion, Power Uprate, and Alternat Alarm Setpoints for the Radiation Monitors at Unit 1.	ive Sourc	•		
•	1.3.19	Engineering Change Package No. ECP-04-0440, Exte	ndad Dav	ver l'Inrote		

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- 3.1.3.20 CR 06-04908, Radiation Monitor Alarm Setpoint Discrepancies. CA-03; revise ODCM procedure 1/2-ODC-2.01 to update the alarm setpoints of [RM-1RW-100] and [RM-1DA-100] for incorporation of the Extended Power Uprate per Unit 1 TS Amendment No. 275.
- 3.1.3.21 CR 06-6476, Procedure 1/2-ODC-2.01 needs revised for Plant Uprate. CA-01; revise ODCM procedure 1/2-ODC-2.01 to update the alarm setpoints of [2SWS-RQ101] for incorporation of the Extended Power Update at Unit 2 (ECP-04-0441) per Unit 2 TS Amendment No. 156

3.2 <u>Commitments</u>

3.2.1 [CTS] Unit 1/2 Technical Specification 6.8.6.a

[ITS] T.S. 5.5.2

4.0 <u>RECORDS AND FORMS</u>

- 4.1 <u>Records</u>
 - 4.1.1 Any calculation supporting ODCM changes shall be documented, as appropriate, by a retrievable document (e.g.; letter or calculation package) with an appropriate RTL number.
- 4.2 <u>Forms</u>
 - 4.2.1 None

5.0 PRECAUTIONS AND LIMITATIONS

- 5.1 BV-1 and BV-2 utilize the concept of a shared liquid radioactive waste system according to NUREG 0133.^(3.1.3.1) This permits the mixing of liquid radwaste for processing and allocating of dose due to release as defined in Section 8.4.
 - 5.1.1 In Section 8.1 of this procedure, effluent monitor setpoints for a conservative mix are based on the individual Units' specific parameters, but effluent monitor setpoints for analysis prior to release permit use of the total dilution flow available at the site.
- 5.2 There is a difference in alarm setpoint terminology presentations for the radiation monitoring systems of BV-1 and BV-2.

5.2.1 Where HIGH and HIGH-HIGH terminology are used for BV-1 monitors, Alert and High terminology is used for BV-2 monitors.

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- 5.2.2 BV-2 setpoints are presented in uCi/ml rather than cpm as in BV-1. This difference is due to BV-2 software which applies a conversion factor to the raw data (cpm). Note that the uCi/ml presentation is technically correct only for the specific isotopic mix used in the determination of the conversion factors. Therefore, BV-2 setpoints determined on analysis prior to release will be correct for properly controlling dose rate, but the indicated uCi/ml value may differ from the actual value.
- 5.3 This procedure also contains information that was previously contained in Section 5 of the previous BV-1 and 2 Offsite Dose Calculation Manual.
 - 5.3.1 In regards to this, the site boundary for liquid effluents was included in this procedure.
 - 5.3.2 The Site Boundary for Liquid Effluents is shown in ATTACHMENT E Figure 5-1.
- 5.4 This procedure includes Improved Technical Specifications (**[ITS]**) information that is NOT applicable to current Technical Specifications (**[CTS]**) and **[CTS]** information that is NOT applicable in **[ITS]**. The **[CTS]** information shall be used prior to the **[ITS]** effective date. The **[ITS]** information shall be used on or after the **[ITS]** effective date.

6.0 ACCEPTANCE CRITERIA

- 6.1 All changes to this procedure shall contain sufficient justification that the change will maintain the level of radioactive effluent control required by 10 CFR 20.1302, 40 CFR Part 190, 10 CFR 50.36a, and Appendix I to 10 CFR 50, and not adversely impact the accuracy or reliability of effluent dose or alarm setpoint calculation.^(3.1.3.2)
 - 6.1.1 All changes to this procedure shall be prepared in accordance with 1/2-ADM-0100^(3.1.3.10) and 1/2-ADM-1640.^(3.1.3.9)
 - 6.1.2 All changes to this procedure shall be reviewed and approved in accordance with NOP-SS-3001^(3.1.3.1) and 1/2-ADM-1640.^(3.1.3.9)

7.0 PREREQUISITES

7.1 The user of this procedure shall be familiar with ODCM structure and format.

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8.0 PROCEDURE

8.1 Alarm Setpoints

8.1.1 BV-1 Monitor Alarm Setpoint Determination

This procedure determines the monitor HIGH-HIGH Alarm Setpoint that indicates if the concentration of radionuclides in the liquid effluent released from the site to unrestricted areas exceeds 10 times the EC's specified in 10 CFR 20, Appendix B (20.1001-20.2402), Table 2, Column 2 for radionuclides other than dissolved or entrained noble gases or exceeds a concentration of 2E-4 uCi/ml for dissolved or entrained noble gases. ^(3.1.1.5)

The methodology described in Section 8.1.1.2 is an alternative method to be used to determine the (RM-1LW-104 or RM-1LW-116) monitor HIGH-HIGH Alarm Setpoint (HHSP). The methodology in Section 8.1.1.2 may be used for any batch release and shall be used when the respective total gamma activity concentration of the liquid effluent prior to dilution exceeds 3.14E-3 uCi/ml and 7.33E-3 uCi/ml. This concentration is equivalent to the respective HHSP's derived in Section 8.1.1.1 and allows for respective tritium concentrations up to 4.26E+0 uCi/ml and 9.94E+0 uCi/ml.^(3.1.1.5)

8.1.1.1 BV-1 Setpoint Determination Based On A Conservative Mix

BV-1 LIQUID MONITOR SETPOINTS							
	cpm Above Background						
	CR	HHSP	HSP				
Liquid Waste Effluent Monitor	RM-1LW-104	3.53E+5	≤ 3.53E+5	≤ 2.47E+5			
Laundry And Contaminated	RM-1LW-116	8.24E+5	≤ 8.24E+5	≤ 5.77E+5			
Shower Drains Monitor							
Component Cooling/	RM-1RW-100	2.57E+4	≤ 2.09E+4	≤ 1.46E+4			
Recirculation Spray Hx River		•					
Water Monitor							
Component Cooling Hx River	RM-1RW-101	9.02E+3	≤ 9.02E+3	≤ 6.32E+3			
Water Monitor				· · · · · · · · · · · · · · · · · · ·			
Aux Feed Pump Bay Drain	RM-1DA-100	1.22E+4	≤ 1.20E+4	≤ 8.43E+3			
Monitor			<u> </u>				

The Alarm Setpoints for the liquid monitors shall be set at the values listed in the following table:

The setpoints for RM-1LW-104 and RM-1LW-116 are based on the following conditions. The setpoint bases for all monitors can be found in Calculation Package ERS-ATL-93-021 and/or S&W Calculation Package No. 8700-UR(B)-223.^(3.1.3.18)

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.:	• Source terms given in ATTACHMENT A Table Zn-65) have been generated from the GALE Con NUREG-0017. ^(3.1.3.3) The inputs to GALE are given the Zn-65 source term was generated via Calcul 021. ^(3.1.1.5, 3.1.3.13)	mputer Code, a iven in 1/2-OI	as described in DC-3.01 Appendix B.
	• Dilution water flow rate of 22,800 gpm = (15,00	00 gpm BV-1 +	⊦ 7,800 gpm BV-2).
	• Discharge flow rate prior to dilution of 35 gpm f (RM-1LW-104).	for the Liquid	Waste Effluent Monito
	• Discharge flow rate prior to dilution of 15 gpm f Shower Drains Monitor (RM-1LW-116).	for the Laundr	y and Contaminated
	The above setpoints for (RM-1LW-104 and RM-1LW operating conditions resulting in changes in the discharge follows:	-	
	$HHSP = \frac{542F}{f}$		[1.1(1)-1]
	where:		
	HHSP = Monitor HIGH-HIGH Alarm Setpoint above	ve background	(ncpm).
	542= Most restrictive proportionality constant bas542= 3.53E+5 ncpm x 35 gpm ÷ 22,800 gpm (RM542= 8.24E+5 ncpm x 15 gpm ÷ 22,800 gpm (RM	M-1LW-104)	al flow conditions:
	F = Dilution water flow rate (gpm), BV-1 plus I Rate (not including release through the Eme	•	
	f = Discharge flow rate prior to dilution (gpm).		
8.1.	1.1.1 BV-1 Mix Radionuclides		
·	The "mix" (radionuclides and composition) as follows:) of the liquid	effluent was determine
· · · · · · · · · · · · · · · · · · ·	• The liquid source terms that are represe effluent were determined. Liquid source of the radionuclides in the effluent from	e terms are th	e radioactivity levels
	· · · · · · · · · · · · · · · · · · ·		

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. · · ·	r	The fraction of the total radioactivity in adionuclide "i" (S _i) for each individual vas determined as follows:			
	S	$\mathbf{h} = \mathbf{A}_{\mathbf{i}}$		[1.1(1)-2]	
		ΣA_i i			
	w	here:		м -	
-		A _i = Annual release of radionuclide "i ATTACHMENT A Table 1.1-1a		ne liquid effluent from	
8.1.1.1.2	BV-1	Maximum Acceptable Concentration	(All Radionu	clides)	
		maximum acceptable total radioactivity nuclides in the liquid effluent prior to c			
	$C_t = $	<u>F</u>		[1.1(1)-3]	
	f	$\frac{\sum \underline{S_i}}{i \text{ OEC}_i}$		4	
	where	:			
	F	= Dilution water flow rate (gpm), BV Blowdown Rate (not including relea Structure).	-		
		= 22,800 gpm = (15,000 gpm BV-1 +	7,800 gpm B	V-2)	
	f	= Maximum acceptable discharge flow	w rate prior to	dilution (gpm).	
		= 35 gpm for Liquid Waste Effluent N	Aonitor (RM-	1LW-104).	
		= 15 gpm for Laundry and Contamina 1LW-116).	ted Shower D	Drains Monitor (RM-	
. ·	OECi	 The ODCM liquid effluent concentr (uCi/ml) from ATTACHMENT A 1 times the new 10 CFR 20, Appendix 2 EC values. 	Table 1.1-1a.	The OEC is set at 10	
	Si	= The fraction of total radioactivity at Equation [1.1(1)-2].	tributed to rac	dionuclide "i", from	

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8.1.1.1.3	BV-1 Maximum Acceptable Concentration	on (Individual R	adionuclide)	
· · · · · · ·	The maximum acceptable radioactivity of "i" in the liquid effluent prior to dilution	•	· ·	
	$C_i = S_i C_t$		[1.1(1)-4]	
8.1.1.1.4	BV-1 Monitor Count Rate			
-	The calculated monitor count rate (ncpm radionuclides; (CR) was determined by:) above backgrou	und attributed to the	
	$CR = \sum_{i} C_{i} E_{i}$		[1.1(1)-5]	
	where:		:	
n a shi Na shi	E _i = Detection efficiency of the mo from ATTACHMENT A Tab Calculation Package ERS-SFI	le 1.1-1a. If not		
8.1.1.1.5	BV-1 Monitor HHSP			
• • •	The monitor HIGH-HIGH Alarm Setpoin set at the CR value. Since only one tank of this value is not necessary to compense source.	can be released	at a time, adjustment	
8.1.1.2 <u>BV-</u>	1 Setpoint Determination Based On Ana	alysis Prior To I	Release	
the r HIG Mon	following method applies to liquid release naximum acceptable discharge flow rate p H-HIGH Alarm Setpoint based on this flo itor (RM-1LW-104) and the Laundry and -1LW-116) during all operational condition	rior to dilution a w rate for the Lic Contaminated Sl	nd the associated uid Waste Effluent	
resul spur	monitor alarm setpoint is set slightly abov ts from the concentration of gamma emitt ious alarms. To compensate for this increa- vable discharge flow rate is reduced by the	ing radionuclides ase in the monito	in order to avoid	
or by	n the discharge flow rate is limited by the administrative selection rather than the a ity concentration, the alarm setpoint will b	llowable flow rat	e determined form	

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8.1.1.2.1	BV-1 Maximum Acceptable Discharge F	low Rate	· v
	The maximum acceptable discharge flow determined by:	v rate (f) prior to	dilution (gpm) is
	f =		[1.1(1)-6]
	$1.25 \Sigma \frac{C_i}{i \text{ OEC}_i}$		
-	where:	an tha Anns an tha	· · · · · · · · · · · · · · · · · · ·
	F = Dilution water flow rate, E Blowdown (gpm).	3V-1 plus BV-2	Cooling Tower
	The dilution water flow ra tower blowdown flow fror structure (but excluding er simultaneous liquid discha	n both units exit nergency outfall	ing the discharge structure flow) when
	C _i = Radioactivity concentratio effluent prior to dilution (u effluent to be released.		
·	1.25 = A factor to prevent spuriou mixture of radionuclides v		
	OEC _i = The ODCM liquid effluent (uCi/ml) from ATTACHM at 10 times the new 10 CF Table 2, Col. 2 EC values.	IENT A Table 1 R 20, Appendix	.1-1a. The OEC is set
8.1.1.2.2	BV-1 Monitor Count Rate	and a second	
· · · ·	The calculated monitor count rate (ncpm radionuclides, (CR) is determined by:) above backgro	und attributed to the
· · ·	$CR = 1.25 \Sigma C_i E_i$		[1.1(1)-7]
	where:		
	E _i = The detection efficiency of the m (cpm/uCi/ml) from ATTACHMI there, from Calculation Package	ENT A Table 1.1	-1a. If not listed
	1.25 = A factor to prevent spurious alar		

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1.25 = A factor to prevent spurious alarms caused by deviations in the mixture of radionuclides which affect the monitor response.

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8.1.1.2.3 BV-1 Monitor HHSP

The liquid effluent monitor HIGH-HIGH Alarm Setpoint above background (ncpm) should be set at the CR value adjusted by any excess dilution factor provided as defined in the following equation:

 $HHSP = CR \quad \underline{f} \\ f'$

[1.1(1)-8]

where:

HSP= Monitor HIGH-HIGH Alarm Setpoint above background.

CR = Calculated monitor count rate (ncpm) from equation [1.1(1)-7].

- f = Maximum acceptable discharge flow rate prior to dilution determined by equation [1.1(1)-6].
- f' = Actual maximum discharge flow rate to be maintained for the discharge. The reduced value of f' may be due to pump limitations or administrative selection.

8.1.2 <u>BV-2 Monitor Alarm Setpoint Determination</u>

This procedure determines the monitor HIGH Alarm Setpoint that indicates if the concentration of radionuclides in the liquid effluent released from the site to unrestricted areas exceeds 10 times the EC's specified in 10 CFR 20, Appendix B (20.1001-20.2402), Table 2, Column 2 for radionuclides other than dissolved or entrained noble gases or exceeds a concentration of 2E-4 uCi/ml for dissolved or entrained noble gases.^(3.1.2.6)

The methodology described in Section 8.1.2.2 is an alternative method to be used to determine the (2SGC-RQ100) monitor HIGH Alarm Setpoint (HSP). The methodology in Section 8.1.2.2 may be used for any batch release and shall be used when the total gamma radioactivity concentration of the liquid effluent prior to dilution exceeds 1.14E-3 uCi/ml. This concentration is equivalent to a monitor response and HIGH Alarm Setpoint derived in Section 8.1.2.1 and allows for a tritium concentration of up to 2.16E+0 uCi/ml. The setpoint was obtained by use of a conversion factor of 5.61E-9 uCi/ml/cpm determined for the nuclide mix.^(3.1.2.6)

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8.1.2.1 **BV-2 Setpoint Determination Based On A Conservative Mix**

The HIGH Alarm Setpoint for the liquid monitors shall be set at the values listed in the following Table:

BV-2 LIQUID MONITOR SETPOINTS							
		µCi/ml Above Backgro					
	Monitor	DV	HSP	ASP			
Liquid Waste Effluent Monitor	2SGC-RQ100	1.14E-3	≤ 1.14E-3	≤ 7.99E-4			
Service Water Monitor	2SWS-RQ101	4.30E-5	≤ 4.30E-5	≤ 3.01E-5			
Service Water Monitor	2SWS-RQ102	4.30E-5	≤ 4.30E-5	≤ 3.01E-5			

The setpoint for 2SGC-RQ100 is based on the following conditions, however, the setpoint bases for 2SWS-RQ101 and 2SWS-RQ102 can be found in Calculation Package ERS-ATL-93-021.^(3.1.2.6)

- Source terms given in ATTACHMENT A Table 1.1-1b. These source terms (without Zn-65) have been generated by using models and input similar to NUREG-0017. The inputs are given in 1/2-ODC-3.01. The Zn-65 source term was generated via Calculation Package No. ERS-ATL-93-021.^(3.1.2.6, 3.1.3.13)
- Dilution water flow rate of 22,800 gpm = (15,000 gpm BV-1 + 7,800 gpm BV-2).

• Discharge flow rate prior to dilution of 80 gpm for the Liquid Waste Effluent Monitor (2SGC-RQ100).

• A software conversion factor of 5.61E-9 uCi/ml/cpm associated with Liquid Waste Effluent Monitor (2SGC-RQ100).^(3.1.2.6)

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		the discharge	2SGC-RQ100) c e and dilution flo			ual operating condition [1.1(2)-1]
· ·	where:					
	HSI	P = Moni	tor HIGH Alarm	Setpoint (uCi/	ml) above	background.
-	- 4.00		ortionality consta $-6 = 1.14E-3$ net			
	F		ion water flow ra (gpm).	tte, BV-1 plus I	3V-2 Cool	ing Tower Blowdown
	f	= Disch	arge flow rate p	rior to dilution	(gpm).	
8.1.2.	1.1 B	V-2 Mix Radi	onuclides			
·		ne "mix" (radi follows:	onuclides and co	omposition) of	the liquid	effluent was determine
	•	effluent wer	re determined. I	iquid source te	rms are th	"mix" of the liquid e radioactivity levels o T A Table 1.1-1b.
·	•	radionuclide				luent comprised by in the liquid effluent
	•	$Si = \underline{Ai}$ ΣA_i i				[1.1(2)-2]
		where:				
			ual release of rac ACHMENT A T	•	Ci/yr) in th	e liquid effluent from
						:

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8.1	.2.1.2	BV-2 Maximum Acceptable Concentration The maximum acceptable total radioactivity radionuclides in the liquid effluent prior to c	concentratio	n (uCi/ml) of all
		$C_{t} = \underline{F}$ $f \Sigma_{i} \frac{S_{i}}{OEC_{i}}$		[1.1(2)-3]
	•	 where: F = Dilution water flow rate (gpm), BV-1 Blowdown Rate (not including releas Structure). 	-	– ,
		= 22,800 gpm = (15,000 gpm BV-1 + 7 f = Maximum acceptable discharge flow		
		= 80 gpm for Liquid Waste Process Eff	-	
		OECi = The ODCM liquid effluent concentra (uCi/ml) from ATTACHMENT A Ta times the new 10 CFR 20, Appendix 2 EC values.	able 1.1-1b. 7	The OEC is set at 10
		S _i = The fraction of total radioactivity attr Equation [1.1(2)-2].	ributed to radi	ionuclide "i", from
8.1	.2.1.3	BV-2 Maximum Acceptable Concentration	(Individual R	adionuclide)
•		The maximum acceptable radioactivity conc "i" in the liquid effluent prior to dilution (C_i)		-
		$C_i = S_i C_t$		[1.1(2)-4]
• •				
				;
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8.1.2.1.4 BV-2 Monitor Display Value				
service and the service of the servi		ed monitor Display Value (u clides; (DV), was determined		ckground attributed to
	DV = 5.61E	-9 Σ _i C _i E _i		[1.1(2)-5]
	where:			
-	5.61E	-9 = Conversion factor (uCi/ the source term mix.	/ml/cpm), an ave	rage determined for
	E i	= Detection efficiency of (cpm/uCi/ml) from AT listed there, from Calcu 026. ^(3.1,2.2)	TACHMENT A	Table 1.1-1b. If not
8.1.2.1.5	BV-2 Monit	or HSP		;
	The monitor the DV valu	HIGH Alarm Setpoint abov e.	e background (u	Ci/ml) should be set a
8.1.2.2 <u>BV</u>	-2 Setpoint De	etermination Based On Ana	<u>alysis Prior To I</u>	Release
The the HIC (2S) The read to a	e following mer maximum acco GH Alarm Setp GC-RQ100) du e monitor alarm ding that result woid spurious	thod applies to liquid release eptable discharge flow rate p oint based on this flow rate f uring all operational condition is setpoint is set slightly above s from the concentration of g alarms. To compensate for the vable discharge flow rate is re	s when determin rior to dilution a for the Liquid W ns. e (a factor of 1.2 gamma emitting i his increase in th	ing the setpoint for nd the associated aste Effluent Monitor 5) the concentration adionuclides in order ae monitor alarm
or t acti	by administrative vity concentration	ge flow rate is limited by the ve selection rather than the al- tion, the alarm setpoint will be a factor provided.	llowable flow rat	te determined form
			·	

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8.1.2.2.1	BV-2 Maximum Acceptable Discharge Flo	ow Rate	
	The maximum acceptable discharge flow r determined by:	ate (f) prior to	dilution (gpm) is
	f=	<i>.</i> .	[1.1(2)-6]
	$1.25 \Sigma_i \underline{C_i}$		
	OECi	5	
	where:		
	F = Dilution water flow rate, BV Blowdown (gpm).	/-1 plus BV-2	Cooling Tower
	structure (but excluding eme simultaneous liquid discharg administratively prohibited. C _i = Radioactivity concentration effluent prior to dilution (uC effluent to be released.	ges from both p of radionuclide	blants are e "i" in the liquid
	effluent to be released.		<i>y</i> 1
	1.25 = A factor to prevent spurious mixture of radionuclides wh		by deviations in the
	1.25 = A factor to prevent spurious	ich affect the r concentration l ·1b. The OEC B (20.1001-20.	by deviations in the nonitor response. imit for radionuclide is set at 10 times the 2402)
	 1.25 = A factor to prevent spurious mixture of radionuclides wh OEC_i = The ODCM liquid effluent of "i" (uCi/ml) from Table 1.1-new 10 CFR 20, Appendix FATTACHMENT A Table 2, 	ich affect the r concentration l ·1b. The OEC B (20.1001-20.	by deviations in the nonitor response. imit for radionuclide is set at 10 times the 2402)
	 1.25 = A factor to prevent spurious mixture of radionuclides wh OEC_i = The ODCM liquid effluent of "i" (uCi/ml) from Table 1.1-new 10 CFR 20, Appendix FATTACHMENT A Table 2, 	ich affect the r concentration l 1b. The OEC B (20.1001-20. , Col. 2 EC val	by deviations in the nonitor response. imit for radionuclide is set at 10 times the 2402)
	 1.25 = A factor to prevent spurious mixture of radionuclides wh OEC_i = The ODCM liquid effluent of "i" (uCi/ml) from Table 1.1-new 10 CFR 20, Appendix FATTACHMENT A Table 2, 	ich affect the r concentration l 1b. The OEC B (20.1001-20. , Col. 2 EC val	by deviations in the nonitor response. imit for radionuclide is set at 10 times the 2402)
	 1.25 = A factor to prevent spurious mixture of radionuclides wh OEC_i = The ODCM liquid effluent of "i" (uCi/ml) from Table 1.1-new 10 CFR 20, Appendix FATTACHMENT A Table 2, 	ich affect the r concentration l 1b. The OEC B (20.1001-20. , Col. 2 EC val	by deviations in the nonitor response. imit for radionuclide is set at 10 times the 2402)
	 1.25 = A factor to prevent spurious mixture of radionuclides wh OEC_i = The ODCM liquid effluent of "i" (uCi/ml) from Table 1.1-new 10 CFR 20, Appendix FATTACHMENT A Table 2, 	ich affect the r concentration l 1b. The OEC B (20.1001-20. , Col. 2 EC val	by deviations in the nonitor response. imit for radionuclide is set at 10 times the 2402)
	 1.25 = A factor to prevent spurious mixture of radionuclides wh OEC_i = The ODCM liquid effluent of "i" (uCi/ml) from Table 1.1-new 10 CFR 20, Appendix FATTACHMENT A Table 2, 	ich affect the r concentration l 1b. The OEC B (20.1001-20. , Col. 2 EC val	by deviations in the nonitor response. imit for radionuclide is set at 10 times the 2402)

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8.1.2.2.2	BV-2 Monitor	Display Value	l	<u> </u>		
		monitor Display Value (es; (DV) is determined l		ckground attributed to		
	DV = (1.25) (5	.61E-9) Σ _i C _i E _i		[1.1(2)-7]		
	where:			- · · · - ·		
	E _i =	The detection efficien (cpm/uCi/ml) from A listed there, from Calc 026. ^(3.1.2.2)	ITACHMENT A	Table 1.1-1b. If not		
	1.25 =	A factor to prevent sp the mixture of radionu response.		•		
	5.61E-9	= Conversion factor (uC the source term mix.	ci/ml/cpm), an ave	rage determined for		
8.1.2.2.3	BV-2 Monitor	HSP				
	should be set at	ent monitor HIGH Alar the DV value adjusted e following equation:	-			
	$HSP = DV \underline{f}$ f'			[1.1(2)-8]		
(where:					
	HSP = Monitor	HIGH Alarm Setpoint a	bove background.			
	DV = Calculate $[1.1(2)-7]$	d monitor concentration].	reading (uCi/ml)	from equation		
		n acceptable discharge f [1.1(2)-6].	ow rate prior to d	ilution determined by		
		aximum discharge flow : ced value of f may be du				

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8.2 Compliance With 10 CFR 20 EC Limits (ODCM CONTROL 3.11.1.1)

8.2.1 Batch Releases

8.2.1.1 Pre-Release

The radioactivity content of each batch release will be determined prior to release in accordance with 1/2-ODC-3.03, Table 4.11-1. In order to assure representative samples, at least two tank volumes of entrained fluid from each tank to be discharged shall be recirculated through the mixing eductors. This will be accomplished by recirculating the tank contents for at least the time periods indicated in

ATTACHMENT B Table 1.2-1a and 1.2-1b. BV-1 and BV-2 will show compliance with ODCM Control 3.11.1.1 in the following manner:

The activity of the various radionuclides in the batch release, determined in accordance with 1/2-ODC-3.03, Table 4.11-1, is divided by the minimum dilution flow to obtain the concentration at the unrestricted area. This calculation is shown in the following equation:

 $Conc_i = \frac{C_i R}{MDF}$

where:

 $Conc_i = Concentration of radionuclide "i" at the unrestricted area (uCi/ml).$

C_i = Concentration of radionuclide "i" in the potential batch release (uCi/ml).

R = Release rate of the batch (gpm).

MDF = Minimum dilution flow (gpm). (May be combined BV-1/BV-2 flow when simultaneous liquid discharges are administratively prohibited).

The projected concentrations in the unrestricted area are compared to the OEC's. Before a release is authorized, Equation [1.2-2] must be satisfied.

 $\Sigma_i (\text{Conc}_i/\text{OEC}_i) < 1$

[1.2-2]

[1.2-1]

where:

OEC_i = The ODCM effluent concentration limit of radionuclide "i" (uCi/ml) from ATTACHMENT A Table 1.1-1a and 1.1-1b. The OEC is set at 10 times th new 10 CFR 20, Appendix B, (20.1001-20.2402) Table 2, Col. 2 EC values.^(3.1.1,3,3.1,2.1)

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8.2.1.2	Post-Release			
	•	se from the batch tank, the Post following manner:	Dose Correctio	on Factor will be
	PDCF = $\frac{(VA_t)}{(}$	DFA)		[1.2-3]
	(VI _t)/(I			[•]
	(
	where:	· · ·		
-	PCDF =	Post Dose Correction Factor	•	
<i>i</i>	$VA_t =$	Actual Volume of tank relea	sed (gal).	
	DFA =	Actual Dilution Flow during	, release (gpm).	
	$VI_t =$	Initial Volume authorized fo	or release (gal).	
	DFI = Initial Dilution Flow authorized for release (gpm).			
	calculated in the	on of each radionuclide followin unrestricted area in the followin or shown in equation [1.2-3] is >	ng manner whe	
	by the actual dil	vity of radionuclide "i" during t ution flow during the period of r area. This calculation is shown	release to obtain	n the concentration in
	$Conc_{ik} = \frac{C_{ik} V_{tk}}{ADF_{k}}$			[1.2-4]
-	where:			
•	Conc _{ik} =	The concentration of radional area, during the release period		ml) at the unrestricted
NOTE:	-	ge is from an isolated well-mixed between average and peak conc mal.		
	C _{ik} =	Concentration of radionuclic time period k.	le "i" (uCi/ml)	in batch release during
	V. =	Volume of Tank released du	ning time nort-	d k (apl)

- V_{tk} = Volume of Tank released during time period k (gal).
- $ADF_k = Actual volume of Dilution Flow during the time period of release k (gal).$

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To show compliance with ODCM CONTROL 3.11.1.1, the following relationship must be satisfied:

 $\Sigma_i(\text{Conc}_{ik}/\text{OEC}_i) \le 1$

[1.2-5]

8.2.2 Continuous Releases

Continuous releases of liquid effluents do not normally occur at BV-1 or BV-2. When they do occur, the concentration of various radionuclides in the unrestricted area would be calculated using Equation [1.2-1] with C_{ik} , the concentration of isotope i in the continuous release. To show compliance with ODCM CONTROL 3.11.1.1, Equation [1.2-5] must again be satisfied.

8.3 Compliance With 10 CFR 50 Dose Limits (ODCM CONTROLS 3.11.1.2 And 3.11.1.3)

BV-1 and 2 utilize the concept of a shared liquid radioactive waste system according to NUREG 0133.^(3.1.3.1) This permits mixing of the liquid radwaste for processing. Since the resulting effluent release cannot accurately be ascribed to a specific reactor unit, the treated effluent releases are allocated as defined below.

8.3.1 Cumulation Of Doses (ODCM CONTROL 3.11.1.2)

The dose contribution from the release of liquid effluents will be calculated monthly for each batch release during the month and a cumulative summation of the total body and organ doses will be maintained for each calendar month, current calendar quarter, and the calendar year to date. The dose contribution will be calculated using the following equation:

$$D_{\tau} = \text{UAF } \Sigma \text{ Air } \Sigma^{m} \Delta t_{k} \text{ Ci}_{k} F_{k}$$

$$i \quad k=1$$
[1.3-1]

where:

 D_{τ} = The cumulative dose commitment to the total body or any organ, τ , from the liquid effluents for the total time period

m $\Sigma \Delta t_k \text{ (mrem)}$ k=1

 Δt_k = The length of the kth release over which C_{ik} and F_k are averaged for all liquid releases (hours).

 C_{ik} = The average concentration of radionuclide, "i" (uCi/ml), in undiluted liquid effluent during time period Δt_k from any liquid release.

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 $A_{i\tau}$ = The site related ingestion dose commitment factor to the total body or any organ τ for each identified principal gamma and beta emitter (mrem-ml per hr-uCi) from ATTACHMENT C Table 1.3-1.

m = Number of releases contributing to the cumulative dose, D_t .

UAF = Unit allocation factor. Provides apportionment of dose between BV-1 and BV-2. Normally set at 0.5 for each unit. (Must total to ≤ 1.0).

 F_k = The near field average dilution factor for Cik during any liquid effluent release. Defined as the ratio of the average undiluted liquid waste flow to the product of the average flow from the site discharge structure during the report period to unrestricted receiving waters, times 3. (3 is the site specific applicable factor for the mixing effect of the BV-1 and BV-2 discharge structure).

The site specific applicable factor of 3 results in a conservative estimate of the near field dilution factor based upon Regulatory Guide $1.113^{(3.1.3.4)}$ methodology and is a factor of 10 below the limit specified in NUREG-0133, Section 4.3.^(3.1.3.1)

The dose factor $A_{i\tau}$ was calculated for an adult for each isotope using the following equation from NUREG-0133.^(3.1.3.1)

$$Ai\tau = 1.14E5 (730/D_w + 21BF_i)DF_{i\tau}$$

[1.3-2]

where:

1.14E5 =
$$\left[\frac{1E6 \text{ pCi}}{\text{uCi}}\right] \times \left[\frac{1E3 \text{ ml}}{1}\right] \times \left[\frac{1\text{yr}}{8760 \text{ hr}}\right]$$

730 = Adult water consumption rate (liters/yr).

 $D_w =$ Far field dilution factor from the near field area within 1/4 mile of the release point to the potable water intake for adult water consumption.

21 =Adult fish consumption (kg/yr).

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	BF _i =	Bioaccumulation factor for radio Regulatory Guide $1.109^{(3.1.3.5)}$ (p not available from that reference 50564. ^(3.1.3.8)	Ci/kg per pCi/l).	However, if data was	
·	~	The bioaccumulation factor for m obtained from either of the above IAEA Safety Series No. 57. Justi documented in Appendix A to C 027. ^(3.1.3.6)	e references noted fication for use of	. It was otained from fthis value is	
	DF _{it} =	Dose conversion factor for radio organ τ (mrem/pCi) from Table I NUREG-0172. ^(3.1.3.7)			
	The for field d	ilution factor (Duv) for DV 1 and DV	V_{2} is 200 This v	alue is based on a total	
	dilution factor and on the opp factor of 600 r Midland intake	ilution factor (Dw) for BV-1 and BV of 600 applicable to the Midland wa oosite bank from BV-1 and BV-2 (i.e epresents a conservative fully mixed is located on the opposite bank and nditions would have to exist for the	ter intake located e., $200 = 600 \div 3$). annual average c l is below the wate	1.3 miles downstream The total dilution ondition. Since the er surface, essentially	
	dilution factor and on the opp factor of 600 re Midland intake fully mixed co the intake. The cumulativ	of 600 applicable to the Midland was osite bank from BV-1 and BV-2 (i.e epresents a conservative fully mixed is located on the opposite bank and	ater intake located $2., 200 = 600 \div 3$). annual average c l is below the water radioactive effluer a calendar quarter	1.3 miles downstream The total dilution ondition. Since the er surface, essentially nt to be transported to	
	dilution factor and on the opp factor of 600 re Midland intake fully mixed co the intake. The cumulativ	of 600 applicable to the Midland was posite bank from BV-1 and BV-2 (i.e epresents a conservative fully mixed e is located on the opposite bank and nditions would have to exist for the e doses (from each reactor unit) for to ODCM CONTROL 3.11.1.2 as for	ater intake located $2., 200 = 600 \div 3$). annual average c l is below the water radioactive effluer a calendar quarter	1.3 miles downstream The total dilution ondition. Since the er surface, essentially nt to be transported to	
· · ·	dilution factor and on the opp factor of 600 re Midland intake fully mixed co the intake. The cumulativ are compared t For the calenda	of 600 applicable to the Midland was posite bank from BV-1 and BV-2 (i.e epresents a conservative fully mixed e is located on the opposite bank and nditions would have to exist for the e doses (from each reactor unit) for to ODCM CONTROL 3.11.1.2 as for	ater intake located $2., 200 = 600 \div 3$). annual average c l is below the water radioactive effluer a calendar quarter	1.3 miles downstream The total dilution ondition. Since the er surface, essentially nt to be transported to	
· · · · · · · · · · · · · · · · · · ·	dilution factor and on the opp factor of 600 re Midland intake fully mixed co the intake. The cumulativ are compared t For the calenda	of 600 applicable to the Midland was posite bank from BV-1 and BV-2 (i.e epresents a conservative fully mixed e is located on the opposite bank and nditions would have to exist for the e doses (from each reactor unit) for to ODCM CONTROL 3.11.1.2 as for ar quarter, em total body	ater intake located $2., 200 = 600 \div 3$). annual average c l is below the water radioactive effluer a calendar quarter	1.3 miles downstream The total dilution ondition. Since the er surface, essentially nt to be transported to and a calendar year	
	dilution factor and on the opp factor of 600 re Midland intake fully mixed co the intake. The cumulative are compared to For the calendar $D_{\tau} < 1.5$ mr	of 600 applicable to the Midland was posite bank from BV-1 and BV-2 (i.e epresents a conservative fully mixed e is located on the opposite bank and nditions would have to exist for the e doses (from each reactor unit) for to ODCM CONTROL 3.11.1.2 as for ar quarter, em total body n any organ	ater intake located $2., 200 = 600 \div 3$). annual average c l is below the water radioactive effluer a calendar quarter	1.3 miles downstream The total dilution ondition. Since the er surface, essentially nt to be transported to and a calendar year [1.3-3]	
· · · ·	dilution factor and on the opp factor of 600 re Midland intake fully mixed co the intake. The cumulative are compared to For the calenda $D_{\tau} < 1.5$ mr $D_{\tau} < 5$ mrent For the calenda	of 600 applicable to the Midland was posite bank from BV-1 and BV-2 (i.e epresents a conservative fully mixed e is located on the opposite bank and nditions would have to exist for the e doses (from each reactor unit) for to ODCM CONTROL 3.11.1.2 as for ar quarter, em total body n any organ	ater intake located $2., 200 = 600 \div 3$). annual average c l is below the water radioactive effluer a calendar quarter	1.3 miles downstream The total dilution ondition. Since the er surface, essentially nt to be transported to and a calendar year [1.3-3]	

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8.3.2 Projection Of Doses (ODCM CONTROL 3.11.1.3)

Doses due to liquid releases shall be projected at least once per 31 days in accordance with ODCM CONTROL 3.11.1.3 and this section. The Liquid Radwaste Treatment System shall be used to reduce the radioactive materials in each liquid waste batch prior to its discharge, when the projected doses due to liquid effluent releases from each reactor unit, when averaged over 31 days would exceed 0.06 mrem to the total body or 0.2 mrem to any organ. Doses used in the projection are obtained according to equation [1.3-1]. The 31-day dose projection shall be performed according to the following equations:

When including pre-release data,

$$D_{31} = \left[\frac{A+B}{T}\right] \quad 31+C$$

When not including pre-release data,

$$D_{31} = \left[\frac{A}{T}\right] \quad 31 + C$$

where:

 D_{31} = Projected 31 day dose (mrem).

A = Cumulative dose for quarter (mrem).

B = Projected dose from this release (mrem).

T = Current days into quarter.

C = Value which may be used to anticipate plant trends (mrem).

8.4 Liquid Radwaste System

The liquid radwaste system has the capability to control, collect, process, store, recycle, and dispose of liquid radioactive waste generated as a result of plant operations, including anticipated operational occurrences. This system also uses some of the components of the steam generator blowdown system for processing.

Simplified flow diagrams of the liquid radwaste systems for BV-1 and BV-2 are provided as ATTACHMENT D Figures 1.4-1 and 1.4-2 respectively. A diagram showing the liquid effluent release points is provided as ATTACHMENT D Figure 1.4-3. A diagram of the site boundary for liquid effluents is provided as ATTACHMENT E Figure 5-1.

Since the concept of a shared liquid radwaste system is used, then any liquid waste generated can be stored, processed and discharged from either BV-1 or BV-2.

[1.3-7]

[1.3-8]

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8.4.1 <u>BV</u>	-1 Liquid Radwaste System Components		
8.4.1.1	1LW-TK-2A/2B: High Level Waste Drain Tan	ks	
	There are two of these tanks, each tank has a cap located on the northwest wall of the Auxiliary B receive liquid wastes from the vent and drain sy	Building (elevati	
8.4.1.2	1LW-TK-3A/3B: Low Level Waste Drain Tank	٢S	
-	There are two of these tanks, each tank has a cap located in the northwest corner of the Auxiliary receive liquid wastes from the vent and drain sys	Building (eleva	•• . •
8.4.1.3	1LW-I-2: Liquid Waste Pre-Conditioning Filter	r & Demineraliz	zer
	The main purpose of the pre-conditioning filter waste water of particulate and dissolved radioac 1LW-TK-2A/2B and 1LW-TK-3A/3B. There are conditioning filter associated with this system. customized with varying grades of activated cha radionuclides in a colloidal state. Each of the de with different resins for effective removal of che radioactive contaminants. Generally, beds 1 and and 4 contain a Mixed Bed Resin. This system is Building (elevation 735').	tive contaminative four resin beau The pre-conditive arcoal intended emineralizer beau emical contamination of the	nts that is stored in ds and a pre- oning filter can be for removal of ds can be customized hants along with tion Resin and beds 3 Decontamination
8.4.1.3	.1 An evaporator (6 gpm) was originally used However, this evaporator was retired prior because of concerns for creating a mixed-	r to initial issue	
8.4.1.4	1LW-TK-7A/7B: Steam Generator Drain Tanks	S	
	There are two of these tanks, each tank has a cap located in the Fuel Pool Leakage Monitoring Ro receive liquid waste that has been processed thro	oom (elevation a composition of the second s	735'). They normally waste demineralizer.
	These tanks can also receive liquid waste from U operation, the tank is placed on recirculation thre radioactivity concentration is acceptable for disc volumes must be recirculated prior to sampling	ough the demin charge. A minin	eralizer until the num of two tank
	operation, the tank is placed on recirculation thre radioactivity concentration is acceptable for disc volumes must be recirculated prior to sampling	ough the demin charge. A minin for discharge po	eralizer until the num of two tank
• • •	operation, the tank is placed on recirculation thre radioactivity concentration is acceptable for disc	ough the demin charge. A minin for discharge po	eralizer until the num of two tank

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8.4.1.5 RM-1LW-104: Liquid Waste Discharge Radiation Monitor

This off-line gamma scintillator radiation monitor continuously analyzes liquid waste as it is being discharged. The upper activity alarm on this radiation monitor has a setpoint that would indicate we are approaching OEC limits for radioactive water leaving the site. If an upper activity alarm on this radiation monitor is received, it automatically terminates the discharge by closing the discharge line isolation valve.

8.4.2 BV-1 Laundry and Contaminated Shower Drain System Components

8.4.2.1 - 1LW-TK-6A/6B: Laundry and Contaminated Shower Drain Tanks

There are two of these tanks, each has a capacity of 1200 gallons. They are located in the northwest corner of the Auxiliary Building (elevation 722'). They receive laundry and contaminated shower drains waste from the Service Building. These tanks can also receive mop water waste from Unit 2. The waste in these tanks is not sent to the liquid waste demineralizer for cleanup because this waste may contain organic compounds that will deplete a resin bed. Upon completion of filling operation, the tank must be recirculated a minimum of two tank volumes prior to sampling for discharge permit preparation.

8.4.2.2 RM-1LW-116: Laundry and Contaminated Shower Drains Tank Discharge Radiation Monitor

This off-line gamma scintillator radiation monitor continuously analyzes laundry and contaminated shower drains waste as it is being discharged. The upper activity alarm on this radiation monitor has a setpoint that would indicate we are approaching OEC limits for radioactive water leaving the site. If an upper activity alarm on this radiation monitor is received, it automatically terminates the discharge by closing the discharge line isolation valve.

8.4.3 **BV-2 Liquid Radwaste System Components**

8.4.3.1 2LWS-TK21A/21B: Waste Drain Tanks

There are two of these tanks, each tank has a capacity of 10,000 gallons. They are located in the northeast corner of the Auxiliary Building (elevation 710'). They receive liquid wastes from the vent and drain system. These tanks can also receive liquid wastes from Unit 1. IF further processing is not necessary, THEN it may be placed on recirculation. A minimum of two tank volumes must be recirculated prior to sampling for discharge permit preparation.

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8.4.3.2	2SGC-IOE21A/21B: Steam Generator Blowdown	Cleanup Ion	
	The main purpose of the ion exchangers is to clean and dissolved radioactive contaminants through an resin bed, outlets strainer, and cleanup filter associa exchangers. They are located in the Waste Handlin	ion exchange ted with each	e process. There is a h of these ion
8.4.3.2	2.1 Two evaporators (20 gpm each) were orignial at Unit 2. However, this evaporator was retir ODCM, because of concerns for creating a m	ed prior to in	
8.4.3.3	2SGC-TK23A/23B: Steam Generator Blowdown T	est Tanks	
	There are two of these tanks, each has a capacity of in the Auxiliary Building (elevation 755'). They rec processed through the cleanup ion exchangers. Up the tank is placed on recirculation through the demi concentration is acceptable for discharge. A minim recirculated prior to sampling for discharge permit	ceive liquid von completion neralizer unt um of two ta	vaste that has been n of filling operation, il the radioactivity
8.4.3.4	2SGC-TK21A/21B: Steam Generator Blowdown H	Iold Tanks	
	There are two of these tanks, each has a capacity of in the Waste Handling Building (elevation 722'). T waste when the radioactive concentration of the stea is not acceptable for discharge. These tanks can al Unit 1. The contents of this tank may be drained or Unit 2 Liquid Radwaste Treatment System until the acceptable for discharge. A minimum of two tank w prior to sampling for discharge permit preparation.	hese tanks ar am generator so receive lie processed th radioactivity	e used to store liquid blowdown test tank quid wastes from rough the Unit 1 or concentration is
8.4.3.5	2SGC-RQ100: Liquid Waste Effluent Monitor		:
		·	· · · · 1-·····························

This off-line gamma scintillator radiation monitor continuously analyzes liquid waste as it is being discharged. The upper activity alarm on this radiation monitor has a setpoint that would indicate we are approaching OEC limits for radioactive water leaving the site. If an upper activity alarm is received, it automatically terminates the discharge by closing the discharge line isolation valves.

- END -

Beaver Valley Power Station			Procedure Number: $1/2$ ODC 2.01	
itle:			Unit:	1/2-ODC-2.01 Level Of Use:
			1/2	General Skill Reference
DCM: LIQUID EFFLUEN	TS		Revision:	Page Number:
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	ATTACHM	ENT A		
	Page 1 c	of 4		
	LIQUID SOUR	CE TERMS		
·				
TABLE 1.1-1a				
BV-1 LIQUID SOURCE TER	M	·		
				(4)
	(2)			Ei
	A	(3)		DETECTION
	ANNUAL RELEASE	OEC		EFFICIENCY
NUCLIDE	<u>(Ci)</u>	<u>(uCi/ml)</u>		(cpm/uCi/ml)
Cr-51	1.3E-3	5E-3		1.18E+7
Mn-54	3.1E-4	3E-4		8.59E+7
Fe-55	1.6E-3	1E-3		(5)
Fo-59	83E-4	1E-4		9.17E+7
Co-58	1.4E-2	2E-4		1.16E+8
Co-60	2.0E-3	3E-5		1.73E+8
Zn-65 ^(3.1.3.13)	2.69E-2	5E-5		4.67E+7
Np-239	1.4E-4	2E-4		8.49E+7
Br-83	2.5E-5	9E-3	da de est	136E+6
Br-84 Br-85	2.5E-5 2.7E-6	4E-3		9.75E+7 6.19E+6
Rb-86	7.5E-5	(5) 7E-5		(5)
Sr-89	2.9E-4	8E-5		(5)
Sr-90	1.1E-5	5E-6		(5)
Y-90	9.4E-6	7E-5		(5)
Y-91m	8.7E-6	2E-2		8.98E+7
Y-91	5.7E-5	8E-5		2.60E+5
Y-93	7.4E-7	2E-4		(5)
Zr-95	5.1E-5	2E-4		8.60E+7
Nb-95	5.2E-5	3E-4		8.64E+7
Sr-91	1.3E-5	2E-4		6.97E+7
Mo-99	1.1E-2	2E-4		2.84E+7
Tc-99m	1.1E-2	1E-2		8.96E+7
Ru-103	3.4E-5	3E-4		9.5E+7
Ru-106	1.0E-5	3E-5 6E-2		(5)
Rh-103m Rh-106	3.4E-5 1.0E-5	(5)		(5) (5)
Te-125m	2.5E-5	2E-4		1.83E+5
Te-127m	2.6E-4	9E-5		4.09E+4
Te-127	2.7E-4	1E-3		1.38E+6
Te-129m	1.1E-3	7E-5		4.02E+6
Te-129	6.7E-4	4E-3	,	1.12E+7
I-130	1.2E-4	2E-4		3.08E+8
Te-131m	1.6E-4	8E-5		1.82E+8
Te-131	3E-5	8E-4		1.20E+8
I-131	1.6E-1	1E-5		1.11E+8
Te-132	4.3E-3	9E-5		1.17E+8
I-132	4.9E-3	1E-3		2.66E+8
I-133	4.0E-2	7E-5		9.90E+7

Beaver V	alley Power Sta	ntion	Procedure Nu		
				<u>1/2-ODC-2.01</u>	
Title:			Unit: 1/2	Level Of Use: General Skill F	aforan
ODOM LIQUID FEFTUR				Page Number:	crerent
ODCM: LIQUID EFFLUE	NIS		Revision: 5	30 of 4	1
	ATTAC	HMENT A			
		e 2 of 4			
		URCE TERMS			
	LIQUID SO				
I-134	8.0E-5	4E-3		2.70E+8	
Cs-134	4.6E-2	9E-6		1.99E+8	
I-135	4.3E-3	3E-4		1.19E+8	
Cs-136	8.9E-3	6E-5		2.80E+8	
Cs-137	3.3E-2	1E-5		8.01E+7	•
Ba-137m	3.1E-2	1E-5		8.01E+7	
Ba-140	1.1E-4	8E-5		4.37E+7	
La-140	1.1E-4	9E-5		2.00E+8	
Ce-141	5.1E-5	3E-4		5.07E+7	
Ce-141	2.8E-6	2E-4		7.27E+7	
Ce-143		3E-5		1.06E+7	
	3.2E-5			2	
Pr-143	2.7E-5	2E-4		1.04E+0	
Pr-144	3.2E-5	6E-3		2.25E+6	
H-3	5.50E+2	1E-2		(5)	
TOTAL ⁽¹⁾	4.05E-1				
(1) Excluding Tritium and Entra					
 (3) ODCM Effluent Concentrat (4) Detection Efficiency for (RI (5) Insignificant 	v1-1LW-104 and RM-1LW-	116) from Calculation I	Package ERS-	SFL-92-039 ^(3.1.1.4)	
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				· · · · · · · · · · · · · · · · · · ·	

itle:	alley Power Station		Unit:	1/2-ODC-2.01 Level Of Use:
			1/2	General Skill Referen
DCM: LIQUID EFFLUE	NTS		Revision: 5	Page Number: 31 of 41
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	Page 3 of 4			
	LIQUID SOURCE	TERMS		
TABLE 1.1-1b				
BV-2 LIQUID SOURCE T	ERM			
	(2)			(4)
	A _i	(3)		DETECTION
• •	ANNUAL RELEASE	OECi		EFFICIENCY
NUCLIDE	<u>(Ci)</u>	<u>(uCi/ml)</u>		(cpm/uCi/ml)
Cr-51	1.00E-4	5E-3		2.01E+7
- Mn-54	2.50E-5	3E-4		1.27E+8
Fe-55	1.30E-4	1E-3		(5)
Fe-59	6.50E-5	1E-4		1.26E+8
Co-58	1.10E-3	2E-4		1.82E+8
Co-60	1.60E-4	3E-5		2.38E+8
Zn-65 ^(3.1.3.13)	5.10E-2	5E-5		6.50E+7
Np-239	320E-5	2E-4		1.65E+8
Br-83	2.90E-5	9E-3		2.42E+6
Br-84	5.90E-9	4E-3		1.38E+8
Rb-86	3.70E-5	7E-5		1.04E+7
Sr-89	2.20E-5	8E-5		1.83E+4
Sr-90	8.50E-7	5E-6		(5)
Sr-91	5.30E-6	2E-4		1.04E+8
Mo-99	2.30E-3	2E-4		4.47E+7
Tc-99m	2.10E-3	1E-2		1.40E+8
Te-125m	1.90E-6	2E-4		3.94E+5 1.26E+5
Te-127m	2.10E-5	9E-5		
Te-127	2.50E-5	1E-3		2.43E+6
Te-129m	820E-5	7E-5		6.53E+6
Te-129	5.30E-5	4E-3		1.96E+7
I-130	230E-4	2E-4		5.18E+8 2.85E+8
Te-131m	520E-5	8E-5		1.88E+8
Te-131	9.40E-6	8E-4		
I-131	1.00E-1	1E-5		1.96E+8 1.76E+8
Te-132	7.80E-4	9E-5		
I-132	2.30E-3	1E-3 7E-5		4.22E+8 1.73E+8
I-133 I-134	6.50E-2 4.60E-6	4E-3		4.06E+8
	3.00E-2	9E-6		3.25E+8
Cs-134 I-135	920E-3	9E-0 3E-4		1.71E+8
Cs-136	9.20E-3 3.90E-3	3E-4 6E-5		4.28E+8
Cs-137 Do 127-0	220E-2	1E-5		1.28E+8
Ba-137m Ba-140	2.10E-2	1E-5		1.33E+8 7.50E+7
Ba-140 La-140	9.30E-6 8.40E-6	8E-5 9E-5		7.50E+7 3.08E+8

4.5

Beaver Valley Power Station			Procedure Nu	mber: 1/2-ODC-2.01
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	•			
	LIQUID SOURC	LE IERIVIS		
TABLE 1.1-1b (continued)				and the second
BV-2 LIQUID SOURCE TERM				
	(2)			
				(4)
	Ai	(2)		Ei
	ANNUAL	(3)		CTION
-	RELEASE	OECi		IENCY
NUCLIDE	<u>(Ci)</u>	<u>(uCi/ml)</u>	<u>(cpm/</u>	uCi/ml)
Y-90	6.00E-7	7E-5		
Y-91m	3.60E-6	2E-2		9E+8
Y-91	4.40E-6	8E-5		5E+5
Y-93	3.00E-7	2E-4		3E+7
Zr-95	4.00E-6	2E-4		5 <u>E</u> +8
Nb-95	4.00E-6	3E-4		3E+8
Ru-103	2.70E-6	3E-4	. 1	E+8
Ru-106	8.20E-7	3E-5		5)
Rh-103m	2.70E-6	6E-2	· ·	5)
Rh-106	8.20E-7			5E+7
Ce-141	4.00E-6	3E-4		5E+7
Ce-143	8.60E-7	2E-4)E+8
Ce-144	2.60E-6	3E-5		7E+7
Pr-143	2.30E-6	2E-4		3E+0
Pr-144	2.60E-6	6E-3)E+6
<u>H-3</u>	<u>5.50E+2</u>	1E-2	(5)
TOTAL ⁽¹⁾	2.40E-1			

 (1) Excluding Tritium and Entrained Noble Gases
 (2) Source Term for (2SGC-RQ100) from Computer Code LIQ1BB ^(3.1.2.3)
 (3) ODCM Effluent Concentration Limit = 10 times the EC values of 10 CFR 20 ^(3.1.2.1)
 (4) Detection Efficiency for (2SGC-RQ100) from Calculation Package ERS-SFL-86-026 ^(3.1.2.2)
 (5) To the Computer Code LIQ1BB (3.1.2.3) ⁽⁵⁾ Insignificant

Beaver Valley Power Station

Title:

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ATTACHMENT B Page 1 of 2 RECIRCULATION TIMES

TABLE 1.2-1a

BV-1 RECIRCULATION TIMES REQUIRED BEFORE SAMPLING OF LIQUID DISCHARGE TANKS

TANK DESCRIPTION	ASSET NO.	APPROXIMATE RECIRCULATION TIME ⁽¹⁾ (Based on Historical Recirculation Rates)
-		
Laundry And Contaminated Shower Dain Tanks	1LW-TK-6A/6B	2.5 hrs - (1200 gal) (2) / (16 gpm)
Low Level Waste Drain Tanks	1LW-TK-3A/3B	1.5 hrs = (2000 gal) (2) / (45 gpm)
High Level Waste Drain Tanks	ILW-TK-2A/2B	3.4 hrs = (5000 gal) (2) / (50 gpm)
Respirator Test Tanks	1LW-TK-5A/5B	1.4 hrs = (3000 gal) (2) / (73 gpm)
Steam Generator Drain Tanks	ILW-TK-7A/7B	17.2 hrs -(35000 gal) (2)/(68 gpm)
Boron Recovery Test Tanks	1BR-TK-2A/2B	9.7 hrs =(13,000 gal) (2)/(45 gpm)

the and the system

(1) The times listed are those approximated for two recirculations of a <u>full</u> tank with <u>one</u> recirculation pump in operation (using <u>historical</u> recirculation rates). Recirculation times for a partially full tank are directly proportional to the fraction of the tank capacity occupied by the entrained liquid waste (after isolation). Actual recirculation times are determined prior to sampling using actual tank volumes and actual recirculation rates available in the BV-1 Control Room.

Beaver Valley Power Station

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ODCM: LIQUID EFFLUENTS

ATTACHMENT B Page 2 of 2

RECIRCULATION TIMES

TABLE 1.2-1b

BV-2 RECIRCULATION TIMES REQUIRED BEFORE SAMPLING OF LIQUID DISCHARGE TANKS

TANK DESCRIPTION	ASSET NO.	APPROXIMATE RECIRCULATION TIME ⁽¹⁾ (Based on Historical Recirculation Rates)
Liquid Waste Tanks	2LWS-TK21A/21B	11.5 hrs = (10,000 gal) (2)/(29 gpm)
Steam Generator Blowdown Hold Tanks	2SGC-TK21A/21B	25.8 hrs = (51,000 gal) (2)/(66 gpm)
Steam Generator Blowdown Test Tanks	2SGC-TK23A/23B	9.1 hrs = (18,000 gal) (2)/(66 gpm)

(1) The times listed are those approximated for two recirculations of a full tank with one recirculation pump in operation (using historical recirculation rates). Recirculation times for a partially full tank are directly proportional to the fraction of the tank capacity occupied by the entrained liquid waste (after isolation). Actual recirculation times are determined prior to sampling using actual tank volumes and actual recirculation rates available in the BV-2 Control Room.

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			Page					÷	
		INGESTION	•	MMITMENT	FACTOR	s			
ABLE 1.3-1									
A _{it} VALUES I	OR THE A		THE BEAV	FR VALLEY	/ SITE				
mrem/hr per u					SIL			· · ·	
NUCLIDE	BONE	LIVER	T-BODY	THYROID	KIDNEY		JG	GHLL	
H-3	0.00E-01	2.70E-01	2.70E-01	2.70E-01	2.70E-01	2.70E-		2.70E-01	
C-14	3.13E04	6.26E 03	6.26E.03	6.26E.03	6.26E 03	626E)3 (526E 03	
Na-24	4.08E 02	4.08E)2 4	4.08E 02					
P-32	4.62E07	2.87E.06	1.79E06	0.00E-01	0.00E-01	0.00E-		5.19E06	
Cr-51 Mn-54	0.00E-01 0.00E-01	0.00E-01 4.38E.03	1.27E00 8.35E02	7.62E-01 0.00E-01	2.81E-01 1.30E 03	1.69E 0.00E-		321E02 134E04	
 Mn-56	0.00E-01	1.10E02	1.95E01	0.00E-01	1.40E02	0.00E-		3.52E03	
Fe-55	6.59E.02	4.56E02	1.95E01 1.06E02	0.00E-01	0.00E-01	2.54E		261E02	
Fe-59	1.04E03	2.45E 03	9.38E 02	0.00E-01	0.00E-01	6.83E	02 8	8.15E03	
Co-57	0.00E-01	2.10E01	3.50E01	0.00E-01	0.00E-01	0.00E-		533E02	
Co-58	0.00E-01	8.95E01	2.01E02	0.00E-01	0.00E-01	0.00E4		1.81E03	
Co-60	0.00E-01	2.57E02	5.67E 02	0.00E-01	0.00E-01	0.00E-		1.83E03	
NI-63	3.12E04 1.27E02	2.16E03	1.05E 03	0.00E-01 0.00E-01	0.00E-01	0.00E- 0.00E-		151E02	
Ni-65 Cu-64	0.00E-01	1.65E 01 1.00E 01	7.51E00 4.70E00	0.00E-01	0.00E-01 2.52E 01	0.00E-		1.17E02 3.53E02	
 Zn-65	2.32E04	7.37E04	3.33E04	0.00E-01	4.93E04	0.00E-)1 4	1.64E.04	
Zn 69	4.93E01	9.43E01	6.56E.00	0.00E-01	6.13E01	0.00E-) 1 1	.42E01	
Br-83	0.00E-01	0.00E-01	4.04E 01	0.00E-01	0.00E-01	0.00E-	01 5	5.82E01	
Br-84	0.00E-01	0.00E-01	5.24E01	0.00E-01	0.00E-01	0.00E-		1.11E-04	
Br-85 Rb-86	0.00E-01 0.00E-01	0.00E-01 1.01E 05	2.15E00 4.71E04	0.00E-01 0.00E-01	0.00E-01 0.00E-01	0.00E-).00E-01	
Rb-88 Rb-89	0.00E-01 0.00E-01	2.90E 02 1.92E 02	1.54E02 1.35E02	0.00E-01 0.00E-01	0.00E-01 0.00E-01	0.00E+ 0.00E+		1.00E-09 1.12E-11	
Sr-89	2.22E04	0.00E-01	6.39E 02	0.00E-01	0.00E-01	0.00E-		3.57E03	
Sr-90	5.48E.05	0.00E-01	1.34E05	0.00E-01	0.00E-01	0.00E-)1	.58E04	
Sr-91	4.10E02	0.00E-01	1.65E01	0.00E-01	0.00E-01	0.00E-	01 1	1.95E 03	
Sr-92	1.55E02	0.00E-01	6.72E00	0.00E-01	0.00E-01	0.00E-	л 3 	3.08E 03	
Y-90	5.80E-01	0.00E-01	1.55E-02	0.00E-01	0.00E-01	0.00E-		6.15E03	
Y-91m Y-91	5.48E-03 8.50E 00	0.00E-01 0.00E-01	2.12E-04 2.27E-01	0.00E-01 0.00E-01	0.00E-01 0.00E-01	0.00E- 0.00E-		.61E-02 1.68E 03	
Y-92 Y-93	5.09E-02 1.62E-01	0.00E-01 0.00E-01	1.49E-03 4.46E-03	0.00E-01 0.00E-01	0.00E-01 0.00E-01	0.00E- 0.00E-		3.92E 02 5.12E 03	
Zr-95	2.53E-01	8.11E-02	5.49E-02	0.00E-01	1.27E-01	0.00E-		2.57E02	
Zr-97	1.40E-02	2.82E-03	1.29E-03	0.00E-01	4.26E-03	0.00E4	01 8	8.73E.02	
Nb-95	4.47E00	2.49E00	1.34E00	0.00E-01	2.46E00	0.00E-	01 1	51E04	
Nb-97	3.75E02	9.49E-03	3.46E-03	0.00E-01	1.11E-02	0.00E4	л 3	3.50E01	

Beaver	Val	ley P	ower	Station	
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Procedure Nu	imber:
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ODCM: LIQUID EFFLUENTS

ATTACHMENT C Page 2 of 3 INGESTION DOSE COMMITMENT FACTORS

TABLE 1.3-1

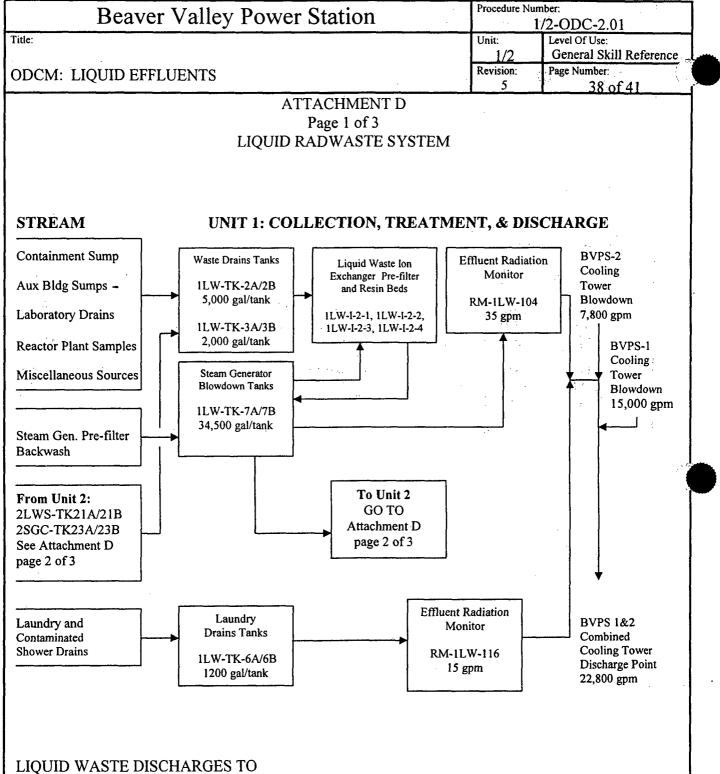
Title:

A_{it} VALUES FOR THE ADULT FOR THE BEAVER VALLEY SITE (mrem/hr per uCi/ml)

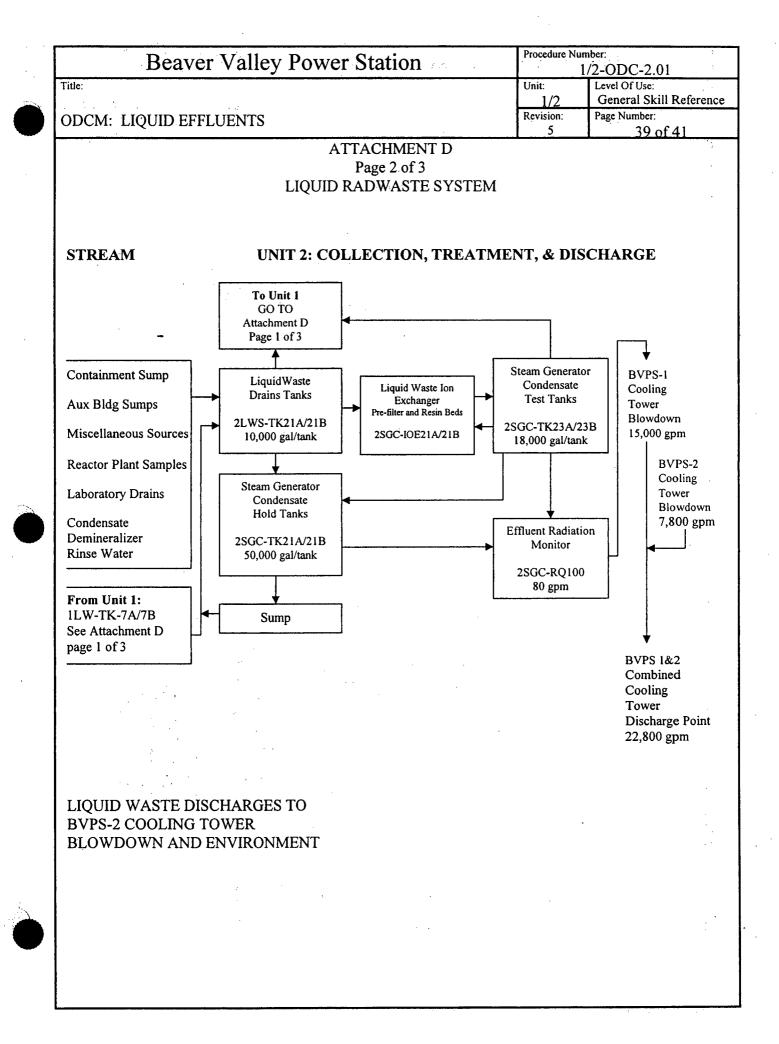
<u>NUCLIDE</u>	BONE	<u>LIVER</u>	<u>T-BODY</u>	<u>THYROID</u>	<u>KIDNEY</u>	<u>LUNG</u>	<u>GI-LLI</u>
Mo-99	0.00E-01	1.05E 02	2.00E 01	0.00E-01	2.38E 02	0.00E-01	2.43E 02
To-99m _	8.97E-03	2.54E-02	3.23E-01	0.00E-01	3.85E-01	1.24E-02	1.50E 01
To-101	9.23E-03	1.33E-02	1.30E-01	0.00E-01	2.39E-01	6.79E-03	4.00E-14
Ru-103	4.51E 00	0.00E-01	1.94E 00	0.00E-01	1.72E 01	0.00E-01	526E 02
Ru-105	3.75E-01	0.00E-01	1.48E-01	0.00E-01	4.85E 00	0.00E-01	229E 02
Ru-106	6.70E 01	0.00E-01	8.48E 00	0.00E-01	1.29E 02	0.00E-01	434E 03
Ag-110m	9.48E-01	8.77E-01	5.21E-01	0.00E-01	1.72E 00	0.00E-01	3.58E 02
Sb-124	7.87E 00	1.49E-01	3.12E 00	1.91E-02	0.00E-01	6.13E 00	223E 02
Sb-125	5.03E 00	5.62E-02	1.20E 00	5.11E-03	0.00E-01	3.88E 00	5.54E 01
Te-125m	2.57E 03	930E02	3.44E 02	7.72E 02	1.04E 04	0.00E-01	1.03E 04
Te-127m	6.49E 03	232E03	7.90E 02	1.66E 03	2.63E 04	0.00E-01	2.17E 04
Te-127	1.05E 02	3.78E01	2.28E 01	7.81E 01	4.29E 02	0.00E-01	8.32E 03
Te-129m	1.10E 04	4.11E 03	1.74E03	3.78E 03	4.60E 04	0.00E-01	5.55E 04
Te-129	3.01E 01	1.13E 01	7.33E00	2.31E 01	1.26E 02	0.00E-01	2.27E 01
Te-131m	1.66E 03	8.10E 02	6.75E02	1.28E 03	8.21E 03	0.00E-01	8.05E 04
Te-131	1.89E 01	7.88E 00	5.96E00	1.55E 01	827E 01	0.00E-01	2.67E 00
Te-132	2.41E 03	1.56E 03	1.47E03	1.72E 03	1,50E 04	0.00E-01	7.39E 04
Te-134	3.10E 01	2.03E 01	1.25E01	2.71E 01	1,96E 02	0.00E-01	3.44E-02
F129	1.19E 02	1.02E 02	3.35E02	2.63E 05	2.19E 02	0.00E-01	1.61E01
F130	2.75E 01	8.10E 01	3.20E01	6.87E 03	1.26E 02	0.00E-01	6.97E01
F131	1.51E 02	2.16E 02	1.24E02	7.08E 04	3.71E 02	0.00E-01	5.70E01
1-132	7.37E 00	1.97E 01	6.90E00	6.90E 02	3.14E 01	0.00E-01	3.71E 00
1-133	5.16E 01	8.97E 01	2.74E01	1.32E 04	1.57E 02	0.00E-01	8.06E 01
1-134	3.85E 00	1.05E 01	3.74E00	1.81E 02	1.66E 01	0.00E-01	9.12E-03
F135	1.61E 01	421E01	1.55E 01	2.78E 03	6.76E 01	0.00E-01	4.76E 01
Cs-134	2.98E 05	7.09E05	5.79E 05	0.00E-01	2.29E 05	7.61E 04	1.24E 04
Cs-136	3.12E 04	123E05	8.86E 04	0.00E-01	6.85E 04	9.39E 03	1.40E 04
Cs-137	3.82E 05	522E 05	3.42E 05	0.00E-01	1.77E 05	5.89E 04	1.01E 04
Cs-138	2.64E 02	522E 02	2.59E 02	0.00E-01	3.84E 02	3.79E 01	2.23E-03
Ba-139	9.69E-01	6.90E-04	2.84E-02	0.00E-01	6.45E-04	3.92E-04	1.72E 00
Ba-140	2.03E 02	2.55E-01	1.33E 01	0.00E-01	8.66E-02	1.46E-01	4.18E 02
Ba-141	4.71E-01	3.56E-04	1.59E-02	0.00E-01	3.31E-04	2.02E-04	2.22E-10
Ba-142	2.13E-01	2.19E-04	1.34E-02	0.00E-01	1.85E-04	1.24E-04	3.00E-19
Læ140	1.51E-01	7.59E-02	2.01E-02	0.00E-01	0.00E-01	0.00E-01	5.57E 03
Læ142	7.71E-03	3.51E-03	8.74E-04	0.00E-01	0.00E-01	0.00E-01	2.56E 01
Cæ141	2.63E-02	1.78E-02	2.02E-03	0.00E-01	826E-03	0.00E-01	6.80E 01

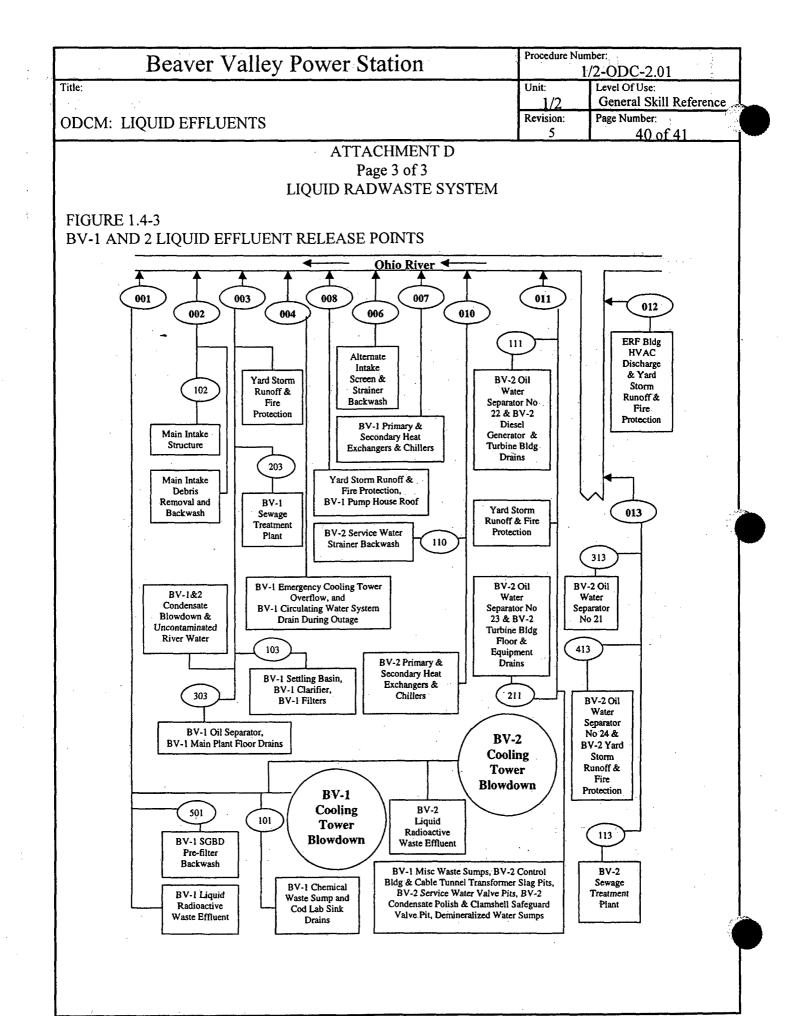
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TAI	BLE 1.3-1									
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:	Co-143	4.64E-03	3.43E00	3.79E-04	0.00E-01	1.51E-		0E-01	1.28E02	
	Ce-144	1.37E00	5.73E-01	7.36E-02	0.00E-01	3.40E-		0E-01	4.64E 02	
• •	Pr-143	5.54E-01	2.22E-01	2.75E-02	0.00E-01	1.28E-	01 0.0	0E-01	2.43E 03	
. •	Pr-144	1.81E-03	7.53E-04	9.22E-05	0.00E-01	4.25E-	04 0.0	0E-01	2.61E-10	
	Nd-147	3.79E-01	4.38E-01	2.62E-02	0.00E-01	2.56E-		0E-01	2.10E 03	
	W-187	2.96E 02	2.47E02	8.65E 01	0.00E-01	0.00E-	01 0.0	0E-01	8.10E 04	
	Np-239	2.90E-02	2.85E-03	1.57E-03	0.00E-01	8.89E-	03 0.0	0E-01	5.85E 02	

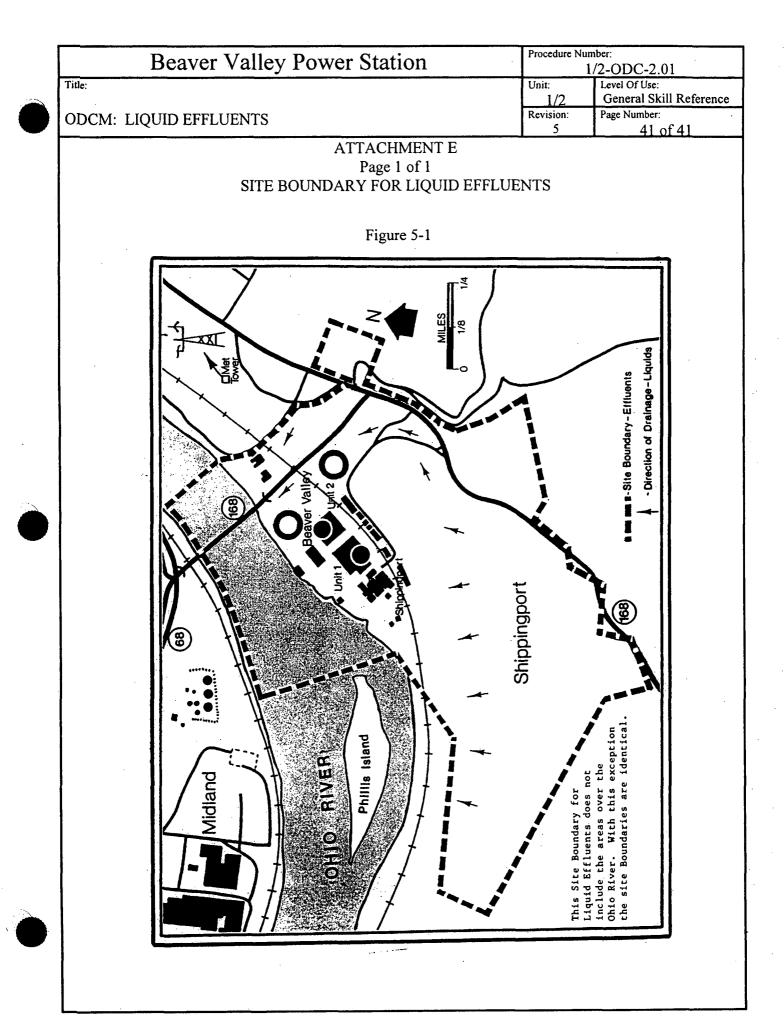
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BVPS-1 COOLING TOWER BLOWDOWN AND ENVIRONMENT







Beaver Valley Power Station

Unit 1/2

1/2-ODC-2.02

ODCM: GASEOUS EFFLUENTS

Document Owner Manager, Nuclear Environmental & Chemistry

Revision Number	2
Level Of Use	In-Field Reference
Safety Related Procedure	Yes



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#### 1.0 <u>PURPOSE</u>

- 1.1 This procedure provides the calculational methodology to be used for determination of the following release parameters.
  - 1.1.1 Gaseous effluent monitor alarm setpoints
  - 1.1.2 Gaseous effluent dose rate calculations
  - 1.1.3 Gaseous effluent dose calculations
- 1.2 This procedure also provides information related to the following:
  - 1.2.1 Gaseous Radwaste Treatment System.
  - 1.2.2 Site Boundary used for gaseous effluents.
- 1.3 Prior to issuance of this procedure, these items were located in Section 2 and Section 5 of the old ODCM.

#### 2.0 <u>SCOPE</u>

2.1 This procedure is applicable to all station personnel (including subcontractors) that are qualified to perform activities as described and referenced in this procedure.

#### 3.0 <u>REFERENCES AND COMMITMENTS</u>

#### 3.1 References

- 3.1.1 References for BV-1 Gaseous Effluent Monitor Setpoints
  - 3.1.1.1 Beaver Valley Power Station, Appendix I Analysis Docket No. 50-334 and 50-412; Table 2.1-3
  - 3.1.1.2 Beaver Valley Power Station, Unit 2 FSAR; Table 11.3-1
  - 3.1.1.3 BVPS Specification No. BVS 414, Table V Nuclide Data,; Table 1 and Figure 1, Table 3, and Figure 2, May 30, 1974
  - 3.1.1.4 Calculation Package No. ERS-SFL-85-031, Unit 1 Gaseous Effluent Monitor Efficiency Data
  - 3.1.1.5 Calculation Package No. ERS-HHM-87-014, Unit 1/Unit 2 ODCM Gaseous Alarm Setpoint Determinations
  - 3.1.1.6 Calculation Package No. ERS-ATL-87-026, BVPS-1 and BVPS-2 ODCM T Factor Justification

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			<u> </u>		
3.1.1.7	Letter ND1SHP:776, dated February 12, 1988, Appendix B	BVPS-1 ODCN	1 lable 2.2-2,		
3.1.1.8	Stone and Webster Calculation No. UR(B)-262 Containment Vacuum Pumps	, Gaseous Relea	ases From		
3.1.2 Re	ferences for BV-2 Gaseous Effluent Monitor Setpo	oints	· .		
3.1.2.1	Calculation Package No.ERS-SFL-86-026, Unit	t 2 DRMS Isoto	pic Efficiencies		
3.1.2.2	Calculation Package No. ERS-HHM-87-014, U Alarm Setpoint Determinations	Init 1/Unit 2 OE	OCM Gaseous		
3.1.2.3	Beaver Valley Power Station, Unit 2 FSAR; Ta	ble 11.3-2			
3.1.2.4	Calculation Package No. ERS-ATL-87-026, BV Factor Justification	VPS-1 and BVP	S-2 ODCM T		
3.1.2.5	Stone and Webster Calculation No. UR(B)-262 Containment Vacuum Pumps	, Gaseous Relea	ases From	•	
3.1.3 Re	ferences Used for other portions of this procedure				
3.1.3.1	NUREG-0133, Preparation of Radiological Eff Nuclear Power Plants	luent Technical	Specifications for		
3.1.3.2	NUREG-1301, Offsite Dose Calculation Manus Effluent Controls for Pressurized Water Reacto Supplement No. 1)	•	-		
3.1.3.3	NUREG-0324; XOQDOQ Program for the Met Releases at Nuclear Power Stations, September	•	aluation of Routine		
3.1.3.4	NUREG-0017; Calculation of Releases of Radi Liquid Effluents form PWR's Revision 0.	oactive Materia	ls in Gaseous and		
3.1.3.5	Regulatory Guide 1.109, Calculation of Annual Releases of Reactor Effluents for the Purpose o 1977				
3.1.3.6	NUREG-0172, Age - Specific Radiation Dose Chronic Intake	Commitment Fa	ctors for a one-year		
3.1.3.7	1/2-ADM-1640, Control of the Offsite Dose Ca	lculation Manu	al		
3.1.3.8	1/2-ADM-0100, Procedure Writers Guide			1	
3.1.3.9	NOP-SS-3001, Procedure Review and Approva	ıl			

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- 3.1.3.10 CR03-04830, Containment Vacuum Pump Replacement Increases ODCM Source Term. CA-03, Revise Unit 1 Containment Vacuum Pump Source-Term in ODCM procedure 1/2-ODC-2.02, Attachment A, Table 2.1-1a.
- 3.1.3.11 CR 05-01169, Chemistry Action Plan for Transition of RETS, REMP and ODCM. CA-16, Revise procedure 1/2-ODC-2.02 to change document owner from Manager, Radiation Protection to Manager, Nuclear Environmental & Chemistry.
- 3.1.3.12 Unit 1 Technical Specification Amendment No. 275 (LAR 1A-302) to License No. DPR-66. This amendment to the Unit 1 license was approved by the NRC on
   July 19, 2006.
- 3.1.3.13 Vendor Calculation Package No. 8700-UR(B)-223, Impact of Atmospheric Containment Conversion, Power Uprate, and Alternative Source Terms on the Alarm Setpoints for the Radiation Monitors at Unit 1.
- 3.1.3.14 Engineering Change Package No. ECP-04-0440, Extended Power Uprate.
- 3.1.3.15 CR 06-04908, Radiation Monitor Alarm Setpoint Discrepancies. CA-02; revise ODCM procedure 1/2-ODC-2.02 to update the alarm setpoints of gaseous effluent radiation monitor for incorporation of the Extended Power Uprate per Unit 1 TS Amendment No. 275.

#### 3.2 Commitments

3.2.1 None

#### 4.0 RECORDS AND FORMS

#### 4.1 Records

4.1.1 Any calculation supporting ODCM changes shall be documented, as appropriate, by a retrievable document (e.g.; letter or calculation package) with an appropriate RTL number.

#### 4.2 **Forms**

4.2.1 None

#### 5.0 PRECAUTIONS AND LIMITATIONS

5.1 ODCM CONTROLS applicable to dose rate apply to the site. The site dose rate is due to the summation of releases from both units.

5.2 ODCM CONTROLS applicable to accumulated dose apply individually to each unit.

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- 5.3 Releases at the Beaver Valley site may be ground level or elevated in nature.
  - 5.3.1 All ground level releases are identified with a specific unit in the determination of site dose rate and dose attributed to that unit.
  - 5.3.2 Elevated releases from both units are considered to originate from a shared radwaste system and are discharged from a common release point, the Process Vent, at the top of the BV-1 cooling tower.
- 5.4 At BV-1 and BV-2, the dose from continuous and batch (Gas Waste Storage Tanks) releases via the shared radwaste system (Process Vent) are normally apportioned equally to the units. Other continuous and batch releases via non-shared radwaste systems shall be attributed to a specific unit. The only exception is a containment purge via the Process Vent which shall be attributed to a specific unit.
- 5.5 There is a difference in setpoint terminology presentations of the radiation monitoring systems of BV-1 and BV-2.
  - 5.5.1 Where HIGH and HIGH-HIGH terminology are used for the BV-1 Victoreen monitors, ALERT and HIGH terminology are used for the BV-1 Eberline SPING monitors and the BV-2 monitors.
  - 5.5.2 Also, BV-2 setpoints are presented in uCi/cc rather than cpm as in BV-1. This difference is due to BV-2 software which applies a conversion factor to the BV-2 raw data (cpm). The user is cautioned that the uCi/cc presentation is technically correct only for the specific isotopic mix used in the determination of the conversion factor. In practice, setpoints determined for a calculated mix are correct for that mix. Setpoints determined on analysis prior to release will be correct for properly controlling dose rate, but the indicated uCi/cc value may differ from the actual value.
  - 5.5.3 All BV-1 and BV-2 effluent monitors specified herein have Upper Alarm Setpoints established at 60 percent of the site limit, and Lower Alarm Setpoints established at 30 percent of the site limit.
- 5.6 A release may be batch or continuous in nature. Batch refers to releases that are intermittent in radionuclide concentrations or flow, such as releases from gas storage tanks, containment purges and ventings of systems or components with infrequent use.
  - 5.6.1 Batch releases may be due to operational variations which result in radioactive releases greater than 50% of the releases normally considered as continuous. Batch releases from these sources during normal operation, including anticipated operational occurrences, are defined as those which occur for a total of 500 hours or less in a calendar year, but not more than 150 hours in any quarter.
  - 5.6.2 The batch relative concentration value has been calculated in accordance with the guidelines provided in NUREG-0324^(3,1,3,3) for short-term release.

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- 5.6.3 <u>IF</u> simultaneous batch and continuous release out of one vent occurs, <u>THEN</u> use the lowest setpoint obtained according to Sections 8.1.1.1 through 8.1.3.2.
- 5.7 This procedure also contains information that was previously contained in Section 5 of the previous BV-1 and BV-2 Offsite Dose Calculation Manual.
  - 5.7.1 In regards to this, the site boundary for gaseous effluents was included in this procedure.
  - 5.7.2 The Site Boundary for Gaseous Effluents is shown in ATTACHMENT P Figure 5-1.

#### 6.0 ACCEPTANCE CRITERIA

- 6.1 All changes to this procedure shall contain sufficient justification that the change will maintain the level of radioactive effluent control required by 10 CFR 20.1302, 40 CFR Part 190, 10 CFR 50.36a, and Appendix I to 10 CFR 50, and not adversely impact the accuracy of effluent dose or alarm setpoint calculation. ^(3.1.3.2)
  - 6.1.1 All changes to this procedure shall be prepared in accordance with 1/2-ADM-0100^(3.1.3.8) and 1/2-ADM-1640.^(3.1.3.7)
  - 6.1.2 All changes to this procedure shall be reviewed and approved in accordance with NOP-SS-3001^(3.1.3.9) and 1/2-ADM-1640.^(3.1.3.7)

#### 7.0 PREREQUISITES

7.1 The user of this procedure shall be familiar with ODCM structure and content.

#### 8.0 **PROCEDURE**

#### 8.1 Alarm Setpoints

#### 8.1.1 BV-1 Monitor Alarm Setpoint Determination

ODCM CONTROL 3.11.2.1 require that the dose rate in unrestricted areas due to noble gas radionuclides in the gaseous effluent released from the site shall be limited to  $\leq 500$  mrem/yr to the total body and to  $\leq 3000$  mrem/yr to the skin.

This section describes the methodology used to maintain the release of noble gas radionuclides within ODCM CONTROL 3.11.2.1 for the site, and determines monitor setpoints for BV-1.

The methodologies described in Section 8.1.1.2, 8.1.2,2, and 8.1.3.2 provide an alternate means of determining monitor alarm setpoints that may be used when an analysis is performed prior to release.

Control of the site dose rate limit due to noble gases is shown in the following Table. Dose rate control is exercised through a total of 8 effluent stream monitors, of which 3 are

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		xists for these monitors), and 3V-2 elevated releases are via		d at BV-2. As	
	Monitor Setpoint Spec	ifications Based On Fraction	Of Site Lim	nit	
. :	UNIT RELEASE POINT MONITOR NO.	FRACTION OF SITE Upper Alarm	LIMITINC Lower A		
· · · ·	(VV-1) Unit 1, Auxiliary Building Pri.: RM-1VS-101B or Alt.: RM-1VS-109 (5)	Vent 60% (HIGH-HIGH) 60% (HIGH)	30% (H) 30% (A)	,	
	(CV-1) Unit 1, Rχ Containment/S Pri.: RM-1VS-107B or Alt.: RM-1VS-110 (5)	LCRS Vent 60% (HIGH-HIGH) 60% (HIGH)	30% (H) 30% (A)	· · ·	
	(PV-1/2), Unit 1/2, Gaseous Waste Pri.: RM-1GW-108B or Alt.: RM-1GW-109 (5)	e/Process Vent 60% (HIGH-HIGH) 60% (HIGH)	30% (Hl 30% (Al	, , , , , , , , , , , , , , , , , , , ,	
. '	(CV-2), Unit 2, SLCRS Filtered Pa 2HVS-RQ109E	athway 60% (HIGH)	30% (Al	LERT)	
	(VV-2), Unit 2, SLCRS Unfiltered 2HVS-RQ101B	l Pathway 60% (HIGH)	30% (Al	LERT)	
	(WV-2), Unit 2, Waste Gas Storag 2RMQ-RQ303B	e Vault Vent 60% (HIGH)	30% (Al	LERT)	
	(DV-2), Unit 2, Decontamination 2 2RMQ-RQ301B	Building Vent 60% (HIGH)	30% (Al	LERT)	
	(CB-2), Condensate Polishing Bui 2HVL-RQ112B	lding Vent 60% (HIGH)	30% (Al	LERT)	

With the monitor setpoints based on fractions of the site limit as defined above, the following criteria may be applied to determine that the dose rate due to noble gas released from the site complies with ODCM CONTROL 3.11.2.1:

• The site dose rate is 30% of the site dose rate limit when any monitor is indicating a Lower Alarm.

• The site dose rate is 60% of the site dose rate limit when any two monitors are indicating Lower Alarms.

- The site dose rate is 60% of the site dose rate limit when any monitor is indicating an Upper Alarm.
- The site dose rate is 90% of the site dose rate limit when any monitor is indicating an Upper Alarm and any other monitor is indicating a Lower Alarm.

	Beaver Valley Power Sta	ation	Procedure Nur		
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tle:			Unit:	Level Of Use:	Reference
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DCM: C	<b>JASEOUS EFFLUENTS</b>		2	-	f 130
8.1.	1.1 <b>BV-1 Setpoint Determination</b> 1 Ground ReleasesThe table below gives the calcundred ncpm, and provides the equival limiting site dose rate limit (i.e., The monitor HIGH-HIGH alarm monitor HIGH alarm setpoint a condition shall be as follows:	llated monitor count r ent monitor indication ; 500 mrem/yr Total 1 n setpoint above back	ate above b n associated Border or 30 ground (HI	ackground ( I with the m 000 mrem/y ISP), and th	(CR), in ost r skin). 1e
			s	· · · · · · · · · · · · · · · · · · ·	
	BV-1 ALARM SET	POINTS FOR GROU	ND RELEA	ASES	
		<b>`</b>	cpm AB	OVE BACK	GROUND
			· : :	60%	30%
		(P)PRIMARY*		SITE	SITE
		MONITOR	ti e i	LIMIT	LIMIT
		(A) ALTERNATE	•	UPPER	UPPER
		MONITOR	CR	ALARM	ALARM
	• Continuous Release Via The BV-1	(P)RM-1VS-101B	3000	≤ 1800	≤ 900
	Auxilary Building Vent (VV-1)	(A)RM-1VS-109(5	5) 1470	≤ 879	≤ 440
	Batch Release Of Containment	(P)RM-1VS-101B	1200	≤ 718	≤ 359
	Purge Via The BV-1 Auxiliary Building Vent (VV-1)	(A)RM-1VS-109(5	5) 1430	≤ 860	≤ 430
	• Continuous Release Via The BV-1	(P)RM-1VS-107B	6440	≤ 3870	≤ 1930
	Rx Containment/SLCRS Vent (CV-1)	(A)RM-1VS-110(5	) 3380	≤ 2030	≤ 1010
	Batch Release Of Containment	(P)RM-1VS-107B	12,700	≤ 7630	≤ 3810
	Purge Via The BV-1 Rx	(A)RM-1VS-110(5	-	≤ 4000	≤ 2000
	Containment/SLCRS Vent (CV-1)			. N	÷ .
•	* <u>IF</u> the primary monitor is out of serventiate the respective alternate monitor. The respective alternate monitor.				net for
	The extension determined universe	the following and its	ng and inf-	motion	
· · ·	The setpoints were determined using	ule following condition	ns and infe	manon:	•
•	• Source terms given in ATTACHN were derived from Stone & Webs 0017), ^(3.1.3.4) and computer code D sources). ATTACHMENT A Tak which are not used in site noble ga	ter computer code GA DRAGON 4 (for the co ble 2.1-1a does not inc	S1BB (sim ontainment clude partic	ilar to NUR vacuum pur	EG- np
	• Onsite meteorological data for the	e period January 1, 19	76 through	December 3	81 <b>, 1980</b> . (
	• Discharge flow rate of 62,000 cfm	for a VV-1 Continue	ous Release	•	•
	<b>₩</b> /				

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- Discharge flow rate of 92,000 cfm for a VV-1 Batch Release of Containment Purge. This is comprised of 30,000 cfm from the containment purge plus 62,000 cfm for VV-1.
- Discharge flow rate of 49,300 cfm for a CV-1 Continuous Release.
- Discharge flow rate of 56,800 cfm for a CV-1 Batch Release of Containment Purge. This is comprised of 7,500 cfm from the containment purge plus 49,300 cfm for CV-1.
- Information listed under References for BV-1 Gaseous Effluent Monitor Setpoints.

The calculation method given in Sections 8.1.1.1.1 through 8.1.1.1.7 was used to derive the monitor setpoints for the following operational conditions:

- Continuous release via VV-1.
- Continuous release via CV-1.
- Batch release of BV-1 Containment Purge via VV-1.
- Batch release of BV-1 Containment Purge via CV-2.

#### 8.1.1.1.1 BV-1 Mix Radionuclides

The "mix" (noble gas radionuclides and composition) of the gaseous effluent was determined as follows:

- The gaseous source terms that are representative of the "mix" of the gaseous effluent were selected. Gaseous source terms are the radioactivity of the noble gas radionuclides in the effluent. Gaseous source terms can be obtained from ATTACHMENT A Table 2.1-1a.
- The fraction of the total radioactivity in the gaseous effluent comprised of noble gas radionuclide "i" (Si) for each individual noble gas radionuclide in the gaseous effluent was determined by:

$$\mathbf{S}_{\mathbf{i}} = \frac{\mathbf{A}_{\mathbf{i}}}{\sum_{i} \mathbf{A}_{\mathbf{i}}}$$

[2.1(1)-1]

where:

 $A_i$  = The total radioactivity or radioactivity concentration of noble gas radionuclide "i" in the gaseous effluent from ATTACHMENT A Table 2.1-1a.

Decaver variety rower station       1/2-ODC-2.02         Title:       Unit:       Level Of Use:         ODCM: GASEOUS EFFLUENTS       1/2       In-Field Reference         8.1.1.1.2       BV-1 Maximum Acceptable Release Rate (Whole Body Exposure)         The maximum acceptable total release rate (uCi/sec) of all noble gas radionuclides in the gaseous effluent (Qt) based upon the whole body exposure limit was calculated by:	Reave	er Valley Power Station	Procedure N	AC N 16 17 A
ODCM: GASEOUS EFFLUENTS       1/2       In-Field Reference         8.1.1.1.2       BV-1 Maximum Acceptable Release Rate (Whole Body Exposure)         The maximum acceptable total release rate (uCi/sec) of all noble gas radionuclides in the gaseous effluent (Qt) based upon the whole body exposure	Deave	ancy rower Station		1/2-ODC-2.02
ODCM: GASEOUS EFFLUENTS       Revision:       Page Number:         2       12 of 130         8.1.1.1.2       BV-1 Maximum Acceptable Release Rate (Whole Body Exposure)         The maximum acceptable total release rate (uCi/sec) of all noble gas radionuclides in the gaseous effluent (Qt) based upon the whole body exposure	Title:		Unit:	Level Of Use:
8.1.1.1.2       BV-1 Maximum Acceptable Release Rate (Whole Body Exposure)         The maximum acceptable total release rate (uCi/sec) of all noble gas radionuclides in the gaseous effluent (Qt) based upon the whole body exposure			1/2	In-Field Reference
8.1.1.1.2       BV-1 Maximum Acceptable Release Rate (Whole Body Exposure)         The maximum acceptable total release rate (uCi/sec) of all noble gas radionuclides in the gaseous effluent (Qt) based upon the whole body exposure	ODCM: GASEOUS FEELIENTS		Revision:	Page Number:
The maximum acceptable total release rate (uCi/sec) of all noble gas radionuclides in the gaseous effluent ( $Q_t$ ) based upon the whole body exposure	ebenn: enisbeed	BAT DO DATIO	2	12 of 130
	8.1.1.1.2	The maximum acceptable total release r radionuclides in the gaseous effluent (Q	ate (uCi/sec) of a	ll noble gas

$$Q_{t} = \frac{500}{(X/Q)\sum_{i}K_{i} S_{i}}$$
[2.1(1)-2]

where:

(X/Q)_{vv} = The highest calculated annual average relative concentration of effluents released via VV-1 for any area at or beyond the unrestricted area boundary for all sectors (sec/m³) from ATTACHMENT F Table 2.2-5.

=  $1.03\text{E-4} \text{ sec/m}^3$  for continuous releases.

 $(X/q)_{vv}$  = The highest calculated short term relative concentration of effluents released via VV-1 for any area at or beyond the unrestricted area boundary for all sectors (sec/m³) from ATTACHMENT M Table 2.3-36.

= 3.32E-4 sec/m³ for batch release of containment purge.

 $(X/Q)_{cv}$  = The highest calculated annual average relative concentration of effluents released via CV-1 for any area at or beyond the unrestricted area boundary for all sectors (sec/m³) from ATTACHMENT F Table 2.2-4.

= 9.24E-5 sec/m³ for continuous releases.

 $(X/q)_{cv}$ 

Ki

Si

The highest calculated short term relative concentration of effluents released via CV-1 for any area at or beyond the unrestricted area boundary for any sectors (sec/m³) from ATTACHMENT M Table 2.3-35.

=  $3.08\text{E-4} \text{ sec/m}^3$  for batch release of containment purge.

The total whole body dose factor due to gamma emissions from noble gas radionuclide "i" (mrem/year/uCi/m³) from ATTACHMENT G Table 2.2-11.

= From equation [2.1(1)-1] above.

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8.1.1.1.3	BV-1 Maximum Acceptable Release R	ate (Skin Expo	<u>sure)</u>
an Aw	Qt was also determined based upon the sl	kin exposure lin	nit by:

$$Q_{t} = \frac{5000}{(X/Q)\sum_{i} (L_{i} + 1.1M_{i}) S_{i}}$$

where:

Mi

- The skin dose factor due to beta emissions from noble gas Li = radionuclide "i"(mrem/year/uCi/m³) from ATTACHMENT G Table 2.2-11.
  - The air dose factor due to gamma emissions from noble gas radionuclide "i"(mrad/year/uCi/m³) from ATTACHMENT G Table 2.2-11.
- The ratio of the tissue to air absorption coefficients over the 1.1 energy range of the photons of interest, (mrem/mrad).

(X/Q)Same as in Section 8.1.1.1.2.

8.1.1.1.4

#### **BV-1 Maximum Acceptable Release Rate (Individual Radionuclide)**

The maximum acceptable release rate (uCi/sec) of noble gas radionuclide "i" in the gaseous effluent (Q_i) for each individual noble gas radionuclide in the gaseous effluent was determined by:

÷.,

 $Q_i = S_i Q_t$ [2.1(1)-4]NOTE: Use the lower of the Qt values obtained in Section 8.1.1.1.2 and 8.1.1.1.3.



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8.1.1.1.5	<b>BV-1 Maximum Acceptable Concentra</b>	ations (Individu	ual Radionuclide)
	The maximum acceptable radioactivity c radionuclide "i" in the gaseous effluent ( radionuclide "i" in the gaseous effluent w	C _i ) for each indi	vidual noble gas
	$C_i = \frac{2.12E - 3 Q_i}{F}$		[2.1(1)-5]
-	where: F = The maximum acceptable release (cfm) as listed in S		ate at the point of
	2.12E-3 = Unit conversion factor (60)		$BE-5 \text{ ft}^3/\text{cc}$ ).
8.1.1.1.6	<b>BV-1 Monitor Count Rate</b>	·	
	The calculated monitor count rate (ncpm) noble gas radionuclide. CR was determined	_	und attributed to the
	$CR = \sum_{i} C_{i} E_{i}$		[2.1(1)-6)]
	where:		
	E _i = The detection efficiency of the moni (cpm/uCi/cc) from ATTACHMENT	-	
8.1.1.1.7	<b>BV-1 Monitor Setpoints</b>	· .	
	The monitor alarm setpoints above backg	ground were dete	ermined as follows:
	• The monitor HIGH-HIGH Alarm Set determined by:	point above bac	kground (ncpm) was
	HHSP = 0.60  x CR		[2.1(1)-7]
	• The monitor HIGH Alarm Setpoint al determined by:	bove background	d (ncpm) was
	$HSP = 0.30 \times CR$		[2.1(1)-8]
	NOTE: The values 0.60 for the HHSP a the total radioactivity concentra monitored pathway to ensure th exceeded due to simultaneous r	tion that may be at the site bound	e released via the dary limit is not

exceeded due to simultaneous releases from both units.

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#### 8.1.1.2 <u>BV-1 Setpoint Determination Based On Analysis Prior To Release For VV-1</u> and CV-1 Ground Releases

When the setpoints established using "the calculated mix" for ground releases do not provide adequate flexibility for operational needs, the method described below may be used in lieu of that set forth in Step 8.1.1.1. In this case, the results of sample analysis are used to determine the source term "mix." This calculational method applies to gaseous releases via VV-1 and CV-1 when determining the setpoint for the maximum acceptable discharge flow rate and the associated HIGH-HIGH Alarm Setpoint based on this flow rate during the following operational conditions:

- Batch release of Containment Purge via VV-1.
- Batch release of Containment Purge via CV-1.

#### 8.1.1.2.1 BV-1 Maximum Acceptable Release Rate

The maximum acceptable discharge flow rate from VV-1 and CV-1 during purging is determined as follows:

• The maximum acceptable gaseous discharge flow rate (f) from VV-1 and CV-1 (cfm) during purging based upon the whole body exposure limit is calculated by:

$$f = \frac{1.06 \text{ S T}}{(X/q) \sum_{i} K_{i} C_{i}}$$
[2.1(1)-17]

where:

1.06

= 500 mrem/yr x 2.12E-3

500 mrem/yr = dose rate limit

2.12E-3 = unit conversion factor =  $(60 \text{ sec/min x } 3.53\text{E-5 } \text{ft}^3/\text{cc})$ 

S

Т

Percent of site dose rate released via this pathway. Up to 60% of the site dose rate is permissible for one release point under the alarm set point rules of Section 8.1.1.

= Maximum valve for T is 16 based on the limiting restriction in ODCM CONTROL 3.11.2.1 where the dose rate for a containment purge may be averaged over a time period not to exceed 960 minutes. (As containment air volume change time period is 60 minutes; T = 960/60 = 16).^(3.1.1.6)

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	(X/q) _{vv}		effluents re	elease d area	d via VV boundary	1 for an for all	y area at o sectors (s	oncentration of or beyond the ec/m ³ ) from	
		. =	3.32E-4 se	c/m ³	ε.	<i>.</i> .	- - -	•	
	(X/q) _{cv}	-	effluents re	elease lary fo	d via CV-	1 for are	eas at or b	oncentration of eyond the unrestricted ATTACHMENT M	
		=	3.08E-4 se	c/m ³			1. e. e.		
	Ki		The total w noble gas r ATTACHN	adion	uclide "i"	(mrem/	•	nma emissions from n ³ ) from	
	Ci	æ	The undilu radionuclid analysis of	le "i"	in the gas	eous sou		f noble gas cc) as determined by	
•	The flo follows		te (f) is also	dete	rmined ba	sed upo	n the skin	exposure limit as	
		e	5.36 S T					[ <u>2</u> 1/1) 19]	
	$f = \frac{1}{(X/q)}$	l) <u>Σ</u> (	$(L_i + 1.1M_i)$	) C _i				[2.1(1)-18]	
	where:		ŕ.,		· *.				
	6.36 =	300	)0 mrem/yr	x 2.12	2 <b>E-3</b>				
	÷.,	300	)0 mrem/yr	=	dose rate	limit	·		
<b>N</b>		2.1	2E-3	=	unit conv (60 sec/m		•	c)	
	L _i =	rad	e skin dose i ionuclide "i -11.					noble gas ACHMENT G Table	
	M _i =	rad						m noble gas ACHMENT G Table	

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	The flow rate (f) is determined by selecting values based on the whole body exposure l shown above. The actual purge flow rate ( below this calculated (f) value or the disch	imit, or the s (cfm) must be	kin exposure limit e maintained at or
8.1.1.2.2	<b>BV-1 Monitor Setpoints</b>	,i.,	
	The monitor alarm setpoints above backgrou	und are deter	mined as follows:
and a second second Second second second Second second	The calculated monitor HIGH-HIGH Alarn (ncpm) attributed to noble gas radionuclide	-	-
	$f \sum C_i E_i$	·	
	$HHSP = \frac{i}{F'}$		[2.1(1)-19]
	HHSP = F'		
	where:		
	f = The maximum acceptable gaseous determined in Section 8.1.1.2.1.	discharge flo	ow rate (cfm)
	F' = The maximum actual or design eff release.	luent flow ra	te (cfm) at the point
	= 92,000 cfm for VV-1		
	= 56,800 cfm for CV-1		
	C _i = The undiluted radioactivity concer "i" in the gaseous source (uCi/cc) gas to be released.		-
an an trainn a thair an t	E _i = The detection efficiency of the mo (cpm/uCi/cc) from ATTACHMEN		
	• When a HIGH-HIGH set point has been section, the monitor HIGH Alarm Setpo determined as follows:		-
•			
	$HSP = HHSP \ge 0.5$		[2.1(1)-20]
	· · · · · · · · · · · · · · · · · · ·		

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#### 8.1.2 BV-2 Monitor Alarm Setpoint Determination

See Section 8.1.1 for a description of Monitor Alarm Setpoint Determinations.

#### 8.1.2.1 <u>BV-2 Setpoint Determination Based On A Calculated Mix For VV-2, CV-2,</u> DV-2, WV-2 and CB-2 Ground Releases.

The table below gives the calculated monitor count rate above background (CR) in ncpm, and provides the equivalent monitor indication (DV) in net uCi/cc associated with the most limiting site dose rate limit (i.e., 500 mrem/yr Total Body or 3000 mrem/yr Skin). The HIGH alarm setpoint (HSP) in uCi/cc above background, and the ALERT alarm setpoint (ASP) in uCi/cc above background for each vent and operational condition shall be as follows:

	BV2 ALARM SET	POINTS FOR GRO				
·			uCi		E BACKO	
	· · · · · · · · · · · · · · · · · · ·			(unless	otherwise s 60%	specified) 30%
					+ + + + +	SITE LIMIT
					LIMIT	LOWER
		· · ·	CR		UPPER	ALARM
		<b>MONITOR</b>	<u>ncpm</u>	DV	<u>ALARM</u>	
•	Continuous Release Via The BV-2 SLCRS Unfiltered Pathway (VV-2)	2HVS-RQ101B	8260	3.01E-4	≤ 1.81E-4	≤ 9.04E-5
•	Batch Release Of Containment Purge Via The BV-2 SLCRS Unfiltered Pathway (VV-2)	2HVS-RQ101B	2020	7.39E-5	≤ 4.43E-5	≤ 2.22E-5
•	Continuous Release Via The BV-2 SLCRS Filtered Pathway (CV-2)	2HVS-RQ109E	4320	2940 μCi/sec	≤ 1770 μCi/sec	≤ 883 μCi/sec
•	Batch Release Of Containment Purge Via The BV-2 SLCRS Filtered Pathway (CV-2)	2HVS-RQ109E	16,400	1130 μCi/sec	≤ 676 μCi/sec	≤ 338 μCi/sec
•	Continuous Release Via The BV-2 Condensate Polishing Building Vent (CB-2)	2HVL-RQ112B	28,900	1.61E-3	≤ 9.63E-4	≤ 4.82E-4
•	Continuous Release Via The BV-2 Decontamination Building Vent (DV-2)	2RMQ-RQ301B	56,600	3.15E-3	≤ 1.89E-3	≤9.44E-4
•	Continuous Release Via The BV-2 Waste Gas Storage Vault Vent (WV-2)	2RMQ-RQ303B	912,000	2.58E-2	≤ 1.55E-2	≤ 7.74E-3

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The setpoints were determined using the following conditions and information:

- Source terms given in ATTACHMENT A Table 2.1-1b. These gaseous source terms were derived from Stone & Webster computer code GAS1BB (similar to NUREG-0017)^(3.1.3.4) and computer code DRAGON 4 (for the containment vacuum pump sources). ATTACHMENT A Table 2.1-1b does not include particulates and iodines, which are not used in site noble gas dose rate calculations.
- The Containment Building Purge radionuclide mix was utilized for the purposes of determining an alarm setpoint for the SLCRS Unfiltered Pathway on the basis of the proximity of the contiguous areas.
  - The Decontamination Building and Condensate Polishing Building ventilation exhaust are not expected to be radioactive. However, for purposes of determining an alarm setpoint, it is conservatively assumed that Xe-133 is in the ventilation exhaust at concentrations that would result in the appropriate dose rate limits.
  - The Waste Gas Storage Vault ventilation exhaust is also not normally radioactive. However, the monitor alarm setpoint is based on the assumption that the ventilation exhaust radionuclide spectrum is similar to the gaseous inventory in the system housed by the waste gas storage vault. This spectrum is listed in ATTACHMENT A Table 2.1-1b under Gaseous Waste System.
  - Onsite meteorological data for the period January 1, 1976 through December 31, 1980.
  - Discharge flow rate of 23,700 cfm for a VV-2 Continuous Release.
  - Discharge flow rate of 53,700 cfm for a VV-2 Batch Release of Containment Purge. This is comprised of 30,000 cfm from the containment purge plus 23,700 cfm from the CV-2.
  - Discharge flow rate of 59,000 cfm for a CV-2 Continuous Release.
  - Discharge flow rate of 59,000 cfm for a CV-2 Batch Release of Containment Purge. This is comprised of 7,500 cfm from the containment purge plus 51,500 cfm from CV-2.
  - Discharge flow rate of 30,556 cfm for a CB-2 Continuous Release.
  - Discharge flow rate of 12,400 cfm for DV-2 Continuous Release.
  - Discharge flow rate of 2,000 cfm for WV-2 Continuous Release.

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	formation listed under References for B etpoints.	V-2 Gaseous Ef	fluent Monitor	
	alculation method given in Sections 8.1. the alarm setpoints for the following op	<b>v</b>		: .
	ontinuous release via VV-2.	ing an Mariana. Na sana ara-tara		- 
• Co	ontinuous release via CV-2.			
<b>~</b> • Ba	atch release of BV-2 Containment Purge	via VV-2.		
• Ba	atch release of BV-2 Containment Purge	via CV-2.		
• Co	ontinuous release via CB-2.			
• Co	ontinuous release via DV-2.			
• Co	ontinuous release via WV-2.	t en en		
8.1.2.1.1	<b>BV-2 Mix Radionuclides</b>	· '.		ļ
	The "mix" (noble gas radionuclides and was determined as follows:	composition) of	the gaseous effluent	
	• The gaseous source terms that are regaseous effluent were selected based and volumetric flowrate. Gaseous so noble gas radionuclides in the effluen obtained from ATTACHMENT A T	on the relative ource terms are to nt. Gaseous sou	stream composition the radioactivity of the	
	• The fraction of the total radioactivity noble gas radionuclide "i" (Si) for ea the gaseous effluent was determined	ch individual no	<b>_</b>	1
• • • • • • • •	$S_i = \frac{A_i}{\sum_i A_i}$		[2.1(2)-1]	
	where:	з		
	A _i = The radioactivity concentration of gaseous effluent (for VV-2, CV- A Table 2.1-1b. However, <u>SINC</u> have a valid source term mix, <u>TH</u> concentration is assumed to be X	2 and WV-2) is <u>CE</u> releases via ( <u>HEN</u> the noble g	from ATTACHMENT CB-2 and DV-2 do not	

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8.1.2.1.2	<u>BV-2 Ma</u>	ximum Acceptable Release Rate	e (Whole Bod	y Exposure)
· · ·.	radionucl	mum acceptable total release rate des in the gaseous effluent $(Q_t)$ be calculated by:	• •	-
	$Q_t = \frac{1}{(X/C)}$	$\frac{500}{\sum_{i} K_{i} S_{i}}$		[2.1(2)-2]
•	where:			
	(X/Q) _{vv}	The highest calculated annual effluents released via VV-2 for unrestricted area boundary for ATTACHMENT F Table 2.2-	r any area at c all sectors (se	or beyond the
		= $1.03E-4$ sec/m ³ for continuous		
. · ·	(X/q) _{vv}	The short term relative concer VV-2 for any area at or beyon all sectors (sec/m ³ ) from ATT	d the unrestric	ted area boundary for
		= $3.32E-4$ sec/m ³ for batch relea	se of containr	nent purge.
	(X/Q)cv	The highest calculated annual effluents released via CV-2 fo unrestricted area boundary for ATTACHMENT F Table 2.2-	r any area at o all sectors (se	or beyond the
		= $9.24\text{E-5}$ sec/m ³ for continuous	releases.	
* . • .	(X/q) _{cv}	The short term relative concer CV-2 for any area at or beyon all sectors (sec/m ³ ) from ATT	d the unrestric	ted area boundary fo
. <b>N</b>		= $3.08E-4$ sec/m ³ for batch relea	se of containm	nent purge.
	(X/Q) _{cp}	The highest calculated annual effluents released via CB-2 for unrestricted area boundary for ATTACHMENT F Table 2.2-	r any area at o all sectors (se	r beyond the
		= $7.35E-5 \text{ sec/m}^3$ for continuous	releases.	

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	(X/Q) _{dv}	The highest calculated annual effluents released via DV-2 for unrestricted area boundary for ATTACHMENT F Table 2.2-	or any area at or all sectors (se	or beyond the
		= $9.24\text{E-5 sec/m}^3$ for continuous	s releases.	
• •	(X/Q) _{wv}	The highest calculated annual effluents released via WV-2 for unrestricted area boundary for ATTACHMENT F Table 2.2-	or any area at all sectors (se	or beyond the
		= $9.24\text{E-5 sec/m}^3$ for continuous	s releases.	•
	K _i	The total whole body dose fac noble gas radionuclide "i" (mr ATTACHMENT G Table 2.2)	em/year/uCi/r	
	Si	= From equation $[2.1(2)-1]$ .		
8.1.2.1.3	<u>BV-2 M</u>	aximum Acceptable Release Rate	e (Skin Expos	<u>ure)</u>
	Qt was a	lso determined based upon the skin	exposure lim	it by:
	$Q_t = \frac{1}{(X_t)}$	$\frac{3000}{(Q) \sum_{i} (L_{i} + 1.1M_{i}) S_{i}}$		[2.1(2)-3]
	where:			
	Li	The skin dose factor due to be radionuclide "i"(mrem/year/uC Table 2.2-11.		
• •	Mi	The air dose factor due to gam radionuclide "i"(mrad/year/uC Table 2.2-11.		
	1.1	= The ratio of the tissue to air ab energy range of the photons of	-	
	(X/Q)	= Same as in Section 8.1.2.1.2.		

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#### 8.1.2.1.4 BV-2 Maximum Acceptable Release Rate (Individual Radionuclide)

The maximum acceptable release rate (uCi/sec) of noble gas radionuclide "i" in the gaseous effluent  $(Q_i)$  for each noble gas radionuclide in the gaseous effluent was determined by:

 $Q_i = S_i Q_t$  [2.1(2)-4]

NOTE: Use the lower of the Q_t values obtained in Section 8.1.2.1.2 and 8.1.2.1.3.

#### 8.1.2.1.5 **BV-2 Maximum Acceptable Concentrations (Individual Radionuclide)**

The maximum acceptable radioactivity concentration (uCi/cc) of noble gas radionuclide "i" in the gaseous effluent (Ci) for each individual noble gas radionuclide in the gaseous effluent was determined by:

$$C_{i} = \frac{2.12E - 3Q_{i}}{F}$$
[2.1(2)-5]

where:

F

= The maximum acceptable effluent flow rate at the point of release (cfm) as listed in Section 8.1.2.1.

2.12E-3 = Unit conversion factor (60 sec/min x 3.53E-5 ft³/cc).

8.1.2.1.6

#### **BV-2 Monitor Count Rate**

The calculated monitor count rate (ncpm) above background attributed to the noble gas radionuclide (CR) was determined by:

$$CR = \sum_{i} C_{i} E_{i}$$

[2.1(2)-6)]

where:

Ei = The detection efficiency of the monitor for noble gas radionuclide "i" (cpm/uCi/cc) from ATTACHMENT B Table 2.1-2b.

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#### 8.1.2.1.7 BV-2 Monitor Setpoints

The monitor alarm setpoints above background were determined as follows:

• The monitor HIGH Alarm Setpoint above background (uCi/cc) was determined by:

HSP = 
$$\frac{0.60 \text{ x CR}}{\text{E}_{i \text{ ave}}}$$
 [2.1(2)-7]

where;

- $E_{i ave}$  = The CR of equation [2.1(2)-6] divided by the sum of the C_i for the respective mix.
- The monitor ALERT Alarm Setpoint above background (uCi/cc) was determined by:

$$ASP = \frac{0.30 \text{ x CR}}{E_{iave}}$$
 [2.1(2)-8]

#### 8.1.2.2 <u>BV-2 Setpoint Determination Based On Analysis Prior To Release for VV-2</u> and CV-2 Ground Releases

When the setpoints established using "the calculated mix" do not provide adequate flexibility for operational needs, the method described below may be used in lieu of that set forth in Section 8.1.2.1. In this case, the results of sample analysis are used to determine the appropriate nuclide mix. This calculational method applies when determining the setpoint for the maximum acceptable discharge flow rate and the associated HIGH Alarm Setpoint based on respective vent flow rate during the following operational conditions:

**'**. ,

• Batch release of Containment Purge via VV-2.

• Batch release of Containment Purge via CV-2.

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8.1.2.2.1	<b>BV-2 Maximum Acceptable Release Rate</b>	2	.*
· · · · ·	The maximum acceptable discharge flow rapurging is determined as follows:	te from VV-2	or CV-2 during
	• The maximum acceptable gaseous disch CV-2 (cfm) during purging based upon calculated by:	-	
	$\mathbf{f} = \frac{1.06 \text{ S T}}{(\text{X/q}) \sum_{i} \text{K}_{i} \text{ C}_{i}}$		[2.1(2)-17]
(2) · · · ·	where:	• •	
	1.06 = 500  mrem/yr x  2.12E-3		
	500  mrem/yr = dose rate lin	mit, whole bo	dy exposure
	2.12E-3 = unit conver= (60 sec/min	-	/cc)
	S = Percent of site dose rate releas the site dose rate is permissibl alarm setpoint rules of Section	e for one relea	
	T = Maximum value for T is 16 ba ODCM CONTROL 3.11.2.1 v	where the dose	e rate for a
	containment purge may be aver exceed 960 minutes. (As cont period is 60 minutes; T = 960/	ainment air v	olume change time
	(X/q) _{vv} = The highest calculated short to effluents released via VV-2 fo	r any area at c	or beyond the
	unrestricted area boundary for ATTACHMENT M Table 2.3	•	ec/m [°] ) from
	$= 3.32E-4 \text{ sec/m}^3$		· .
	(X/q) _{cv} = The highest calculated short te effluents released via CV-2 fo unrestricted area boundary for ATTACHMENT M Table 2.3	r any area at c all sectors (se	or beyond the
	$= 3.08E-4 \text{ sec/m}^3$		

,

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	K _i = The total whole body dose noble gas radionuclide "i" ( ATTACHMENT G Table 2	(mrem/year/uCi/			
	C _i = The undiluted radioactivity radionuclide "i" in the gase analysis of the gas to be rel	ous source (uCi/	-		
-	• The flow rate (f) is also determined b follows:	based upon the sl	kin exposure limit as		
	$f = \frac{6.36 \text{ S T}}{(X/q) \sum_{i} (L_{i} + 1.1M_{i}) C_{i}}$	• •	[2.1(2)-18]		
	where:				
	6.36 = 3000  mrem/yr x  2.12E-3				
	3000 mrem/yr = dose rate lin	nit, skin exposur	e		
	2.12E-3 = unit convers = $(60 \text{ sec/min})$	ion factor x 3.53E-5 ft ³ /cc	)		
	L _i = The skin dose factor due to beta radionuclide "i" (mrem/year/uC 2.2-11.				
	M _i = The air dose factor due to gamma radionuclide "i" (mrad/year/uC) 2.2-11.	na emissions fro i/m³) from ATT.	m noble gas ACHMENT G Table		
· · · ·	(X/q) = Same as above.				
	• The flow rate (f) is determined by sel values based on the whole body expo shown above. The actual purge flow below this calculated (f) value or the vent.	sure limit, or the rate (cfm) must	e skin exposure limit be maintained at or		
	n an	`,			

 $t \in \mathcal{T}$ 

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8.1.2.2.2	BV-2 Monit	or Setpoints		
/	The monitor	alarm setpoints above backgr	ound are deter	nined as follows:
		lated monitor HIGH Alarm S ttributed to the noble gas radi	•	
	$f \Sigma c$	C. E.		
	$HSP = \frac{f \sum_{i} C}{F' E}$	'i ave		[2.1(2)-19]
	where:			
	f	<ul> <li>The maximum accepta (cfm) determined in Se</li> </ul>		
	F'	= The maximum actual o the point of release.	r design effluer	nt flow rate (cfm) at
		= 53,700 cfm for VV-2		
		= 59,000 cfm for CV-2		
	Ci	The undiluted radioaction radionuclide "i" in the determined by analysis	gaseous source	(uCi/cc) as
	Ei	<ul> <li>The detection efficienc radionuclide "i" (cpm/u Table 2.1-2b.</li> </ul>	-	-
	E _{i ave}	= The CR of equation [2: for the respective mix.	1(2)-6] divided	l by the sum of the C
	•			
•	uCi "ca abo setg	enable maintaining a constan /cc in the Digital Radiation N lculated mix" is used rather the ve. This does not cause any point to properly control dose icated uCi/cc value may diffe	Monitoring Syst nan the analysis change in the fr rate. However	em software, the s mix to calculate E _i unction of the monitor t, the monitor
	section, t	HGH Alarm Setpoint has bee he monitor ALERT Alarm Se determined as follows:		• •

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8.1.3		<u>/2 Monitor Alarm Setpoin</u>			.*	
	See S	ection 8.1.1 for a description	on of Monitor Alarm Set	point Deter	mination.	
8.1.3	.1	BV-1/2 Setpoint Determi	nation Based On A Ca	lculated M	ix For PV-1/2	2
		Elevated Releases				
		The calculated monitor co				
		HIGH-HIGH alarm setpoin				
	-	alarm setpoint above backy the following Table:	ground (HSP) for each o	perational of	condition are s	shown in
		the following Table:				
	Γ	BV-1/2 ALAR	RM SETPOINTS FOR E			<u> </u>
				cpm A	BOVE BACK	GROUNI
	ſ	· · ·			60% SITE	30%
			(P)PRIMARY*		LIMIT	SITE
			<u>MONITOR</u> (A)ALTERNATE		UPPER <u>ALARM</u>	LIMIT LOWER
			$\cdot$ <u>MONITOR</u>	CR		ALARM
		Continuous Release	(P)RM-1GW-108B	3.49E7	≤ 3.60E5	≤ 1.20E5
		- Commuous Reicase	(A)RM-1GW-109(5)	2.61E7	≤ 3.60E5	≤ 1.20E5
			(11)(11)(11)(10)(10)(0)			$\geq 1.20$ CO
		Batch Release Of	(P)RM-1GW-109(5)	3.93E5	≤ 2.36E5	
r		<ul> <li>Batch Release Of BV-1 Decay Tanks or BV-2 Storage Tanks</li> </ul>		3.93E5 7.87E6		≤ 1.20E3 ≤ 1.18E5 ≤ 1.20E5

The setpoints were determined using a calculated mix from the FSAR and discharge flow rate of 1450 cfm for PV-1/2.

The calculational method below was used to derive the monitor setpoints for the following operational conditions:

- Continuous release via PV-1/2.
- Batch release of BV-1 or BV-2 Waste Gas Decay Tank via PV-1/2.
- Batch release of BV-1 or BV-2 Containment Purge via PV-1/2 is not shown in the above table. However, if it is necessary to perform a BV-1 or BV-2 Containment Purge via this release point, the alarm setpoint shall be calculated in accordance with Section 8.1.3.2.

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# 8.1.3.1.1 BV-1/2 Mix Radionuclides

The "mix" (noble gas radionuclides and composition) of the gaseous effluent was determined as follows:

- The gaseous source terms that are representative of the "mix" of the gaseous effluent were evaluated. Gaseous source terms are the radioactivity of the noble gas radionuclides in the effluent. The gaseous source terms can be obtained from ATTACHMENT A Tables 2.1-1a. and 2.1-1b.
- The fraction of the total radioactivity in the gaseous effluent comprised by noble gas radionuclide "i" (Si) for each individual noble gas radionuclide in the gaseous effluent was calculated by:

$$S_i = \frac{A_i}{\sum\limits_i A_i}$$

where:

A_i = The total radioactivity or radioactivity concentration of noble gas radionuclide "i" in the gaseous effluent from ATTACHMENT A Table 2.1-1a and 2.1.1b.

#### 3.1.2 <u>BV-1/2 Maximum Acceptable Release Rate (Whole Body Exposure)</u>

The maximum acceptable total release rate (uCi/sec) of all noble gas radionuclides in the gaseous effluent ( $Q_t$ ) based upon the whole body exposure limit was determined by:

$$Q_t = \frac{500}{\sum V_i S_i}$$

[2.1.10]

[2.1-9]

where:

 $V_i$  = The constant for noble gas radionuclide "i" accounting for the gamma radiation from the elevated finite plume (mrem/year/uCi/sec) from ATTACHMENT G Table 2.2-12.

 $S_i =$  From equation [2.1-9]



#### 8.1.3.1.2

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8.1.3.1.3	BV-1/2 N	laximum Acceptable Release Rat	<u>2</u> e (Skin Exp	<u> </u>
		so determined based upon the skin		
	$Q_t = \frac{1}{\sum f_{t}}$	$\frac{3000}{L_{i}(X/Q)_{pv} + 1.1B_{i}]S_{i}}$	· · ·	[2.1-11]
· ·	where:			
-	L _i	The skin dose factor due to beta radionuclide "i"(mrem/year/uC Table 2.2-11.		Ų
	(X/Q) _{pv}	The highest calculated annual a effluents releases via PV-1/2 fo unrestricted area boundary for a ATTACHMENT F Table 2.2-6	r any area at all sectors (se	or beyond the
	:	= $2.31\text{E-6 sec/m}^3 (0.5 - 1.0 \text{ miles})$	)	
	(X/q) _{pv}	The highest calculated short ter effluents released via PV-1/2 for unrestricted area boundary for a ATTACHMENT N Table 2.3-3	r any area at 11 sectors (se	t or beyond the
	:	= $1.07\text{E-5} \text{ sec/m}^3 (0.5 - 1.0 \text{ miles})$	, <b>)</b>	
	Bi	The constant for long term releat noble gas radionuclide "i" accound dose from the elevated finite plu ATTACHMENT G Table 2.2-1	unting for th ume (mrad/y	e gamma radiation
8.1.3.1.4	<u>BV-1/2 M</u>	aximum Acceptable Release Rat	e (Individua	al Radionuclide)
	the gaseou	num acceptable release rate (uCi/se is effluent (Q _i ) for each individual i fluent was determined by:		-
	$Q_i = S_i Q_i$			[2.1-12]
		Use the lower of the $Q_t$ values obtain 8.1.3.1.3.	ned in Secti	on 8.1.3.1.2 and

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# 8.1.3.1.5 BV-1/2 Maximum Acceptable Concentrations (Individual Radionuclide)

The maximum acceptable radioactivity concentration (uCi/cc) of noble gas radionuclide "i" in the gaseous effluent ( $C_i$ ) for each individual noble gas radionuclide in the gaseous effluent was determined by:

$$C_{i} = \frac{2.12E - 3Q_{i}}{F}$$
[2.1-13]

where:

2.12E-3 = Unit conversion factor (60 sec/min x 3.53E-5 ft³/cc).

F = The maximum acceptable effluent flow rate at the point of release (cfm) as listed in Section 8.1.3.1.

#### 8.1.3.1.6 BV-1/2 Monitor Count Rate

The calculated monitor count rate (ncpm) above background attributed to the noble gas radionuclide. (CR) was determined by:

 $CR = \sum_{i} C_{i} E_{i}$  [2.1-14]

where:

 $E_i$  = The detection efficiency of the monitor for noble gas radionuclide "i" (cpm/uCi/cc) from ATTACHMENT B Table 2.1-2a and 2.1-2b.

# 8.1.3.1.7 BV-1/2 Monitor Setpoints

The monitor alarm setpoints above background were determined as follows:

• The monitor HIGH-HIGH Alarm Setpoint above background (ncpm) was determined by:

HHSP = 
$$0.60 \times CR$$
 [2.1-15]

• The monitor HIGH Alarm Setpoint above background (ncpm) was determined by:

$$HSP = 0.30 \times CR$$
 [2.1-16]

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# 8.1.3.2 <u>BV-1/2 Setpoint Determination Based On Analysis Prior To Release For PV-</u> <u>1/2 Elevated Releases</u>

The following calculation method applies to gaseous releases via the PV-1/2 Gaseous Waste/Process Vent when the "calculated mix" does not provide adequate operational flexibility. This method is used to determine the setpoint for the maximum acceptable discharge flow rate and the associated HIGH-HIGH Alarm Setpoint based on this flow rate for the BV-1/2 Gaseous Waste Gas Monitor (RM-GW-108B) or alternate (RM-1GW-109 CH 5) during the following operational conditions:

- Continuous release via PV-1/2.
- Batch release of BV-1 or BV-2 Waste Gas Decay Tank via PV-1/2.
- Batch release of BV-1 or BV-2 Containment Purge via PV-1/2.

# 8.1.3.2.1 BV-1/2 Maximum Acceptable Release Rate

Determine the maximum acceptable discharge flow rate for the release from the Process Vent for the analyzed mix.

• The maximum acceptable gaseous discharge flow rate (f) from the Process Vent (cfm) based upon the whole body exposure limit is determined by:

$$f = \frac{1.06 \text{ S}}{\sum\limits_{i} \text{ V}_{i} \text{ C}_{i}}$$
[2.

where:

1.06

= 500 mrem/yr x 2.12E-3

500	mrem/yr	
200	nneni/yr	

m/yr = dose rate limit, whole body exposure

- 2.12E-3 = unit conversion factor =  $(60 \text{ sec/min x } 3.53\text{E-5 ft}^3/\text{cc})$
- S
- Percent of site dose rate released via this pathway. Up to 60% of the site dose rate is permissible for one release point under the alarm setpoint rules of Section 8.1.3.

Vi

The constant for noble gas radionuclide "i" accounting for the gamma radiation from the elevated plume (mrem/year/uCi/sec) from ATTACHMENT G Table 2.2-12.

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	Ci	radior			f noble gas (cc) as determined by
	• Base	d upon the ski	n exposure limit, (	f) is calculated by:	
		6.36	S		
	$f = \overline{5}$	6.365 C[L _i (X/Q) _{pv} -	+1 1B 1C		[2.1-22]
	2 i				
whe	ere:				
	6.36	= 3000 m	rem/yr x 2.12E-3		
		3000 mrem/y	r = dose ra	te limit, skin expos	ure
		2.12E-3		nversion factor /min x 3.53E-5 ft ³ /	cc)
	L _i		clide "i" (mrem/ye	o beta emissions fro ar/uCi/m ³ ) from A	
· · .	(X/Q) _{pv}	effluent unrestri	s released via PV-	nual average relativ 1/2 for any area at o 7 for all sectors (sec 2.2-6.	or beyond the
		= 2.31E-6	$sec/m^3$		
	(X/q) _{pv}	released	l via PV-1/2 for an	y area at or beyond	ncentration of effluent the unrestricted area CHMENT N Table
		= 1.07E-5	sec/m ³		
· · · · · · · · · · · · · · · · · · ·	Bi	noble gather the elev	as radionuclide "i"	accounting for the mrad/year/uCi/sec)	han 500 hrs/year) for gamma radiation from from
	and based	on the skin ex		above. The actua	e body exposure limi l discharge flow rate

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8.1.3.2.2	BV-1/2 Monitor Setpoints	. 2	<u>34 of 130</u>
	The monitor alarm setpoints above back	ground are deterr	nined as follows:
	• The calculated monitor HIGH-HIGH (ncpm) attributed to the noble gas ra	-	_
	$HHSP = \frac{f \sum_{i} C_{i} E_{i}}{F'}$		[2.1-23]
where:			
	f = The maximum acceptable gase determined in Section 8.1.3.2.	-	ow rate (cfm)
	F' = The maximum actual or design release.	n effluent flow rat	te (cfm) at the point of
	= 1450 cfm for PV-1/2		
	C _i = The undiluted radioactivity of gaseous source (uCi/cc) as det released.	-	
	E _i = The detection efficiency of the or (RM-1GW-109 CH 5) for n from ATTACHMENT B Table	oble gas radionuc	clide "i" (cpm/uCi/cc)
	When a HIGH-HIGH Alarm Setpoint ha section the monitor HIGH Alarm setpoir determined by:		. –
•	$HSP = HHSP \ge 0.5$		[2.1-24]
<b>.</b> '	•		
		- (	
		на Х.,	

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### 8.2 Compliance With 10 CFR 20 Dose Rate Limits (ODCM CONTROL 3.11.2.1)

#### 8.2.1 Dose Rate Due To Noble Gases

The dose rate in unrestricted areas resulting from noble gas effluents from the site is limited to 500 mrem/yr to the total body and 3,000 mrem/yr to the skin. Site gaseous effluents are the total of BV-1 and BV-2 specific ground releases and a shared elevated release, the PV-1/2 Gaseous Waste/Process Vent. Based upon NUREG-0133 ^(3.1.3.1) the following equations are used to show compliance with ODCM CONTROL 3.11.2.1.a.

$$\sum_{i} \left[ V_{i} Q_{is} + K_{i} (\overline{X/Q})_{v} Q_{iv} \right] < 500 \text{ mrem/yr}$$

$$\sum_{i} \left[ \left[ L_{i} (\overline{X/Q})_{s} + 1.1B_{i} \right] Q_{is} + \left[ L_{i} + 1.1M_{i} \right] (\overline{X/Q})_{v} Q_{iv} \right] \le 3000 \text{ mrem/yr}$$
[2.2-1]
$$(2.2-2)$$

where:

Li

Qis

- K_i = The total body dose factor due to gamma emissions for each identified noble gas radionuclide "i", mrem/year/uCi/m³.
  - = The skin dose factor due to beta emissions for each identified noble gas radionuclide "i", mrem/year/uCi/m³.
- $M_i$  = The air dose factor due to gamma emissions for each identified noble gas radionuclide "i", mrad/year/uCi/m³.

 $V_i$  = The constant for each identified noble gas radionuclide "i" accounting for the gamma radiation from the elevated finite plume, mrem/year/uCi/sec.

- B_i = The constant for long-term releases (greater than 500 hrs/year) for each identified noble gas radionuclide "i" accounting for the gamma radiation from the elevated finite plume, mrad/year/uCi/sec.
- 1.1 = The ratio of the tissue to air absorption coefficients over the energy range of the photon of interest, mrem/mrad.

= The release rate of noble gas radionuclide "i" in gaseous effluents from freestanding stack, uCi/sec.

Q_{iv} = The release rate of noble gas radionuclide "i" in gaseous effluents from all vent releases, uCi/sec.

 $(X/Q)_s$  = The highest calculated annual average relative concentration for any area at or beyond the unrestricted area boundary for elevated releases (sec/m³).

 $(\overline{X/Q})_v$  = The highest calculated annual average relative concentration for any area at or beyond the unrestricted area boundary for elevated releases (sec/m³).



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		over Valley site gaseous releases may occ hown in ATTACHMENT P Figure 2.4.2		ing Release Points		
	RP 1 & 4.	The BV-1 Auxiliary Building Vent and atop the Auxiliary Buildings (VV-1 an		Unfiltered Pathway		
	RP 2 & 5.	The BV-1 Rx Containment/SLCRS Ve atop the Containment Domes (CV-1 ar		CRS Filtered Pathway		
	RP 3.	The BV-1/2 Gaseous Waste/Process V	ent atop the BV-1 (	Cooling Tower (PV-1/2)		
	RP 6.	The BV-2 Condensate Polishing Build	ing Vent (CB-2)			
	RP 7.	The BV-2 Waste Gas Storage Vault V	ent (WV-2)			
	RP 8.	The BV-2 Decontamination Building	/ent (DV-2)			
	RP 9.	The BV-2 Turbine Building Vent (TV	2)			
	of thes	fluents from Release Point 1 & 4 are gro e releases are Containment Purges and n he sources of these releases are Contains tion.	ormal Auxiliary Bu	ilding Ventilation. At		
	source (SLCR	nt from the Release Point 2 & 5 are assur of these releases is the Supplementary L S). At BV-2 the source of these releases ation. It is also possible to release Conta	eak Collection and is normal Auxiliar	Release System y Building		
	• Release	e Points 6, 7, 8 and 9 are not normally ra	dioactive release po	oints.		
		fluent from Release Point 3 are elevated, Condenser Air Ejectors, the Waste Gas D				
~	compliance 2] are expr for release	releases may normally occur from Releases with the site limits of ODCM CONTR essed in terms of the actual release point points 6, 7, 8 and 9 are included for use identified in the future.	OL 3.11.2.1.a, Equa s for the site. Note	ations [2.2-1] and [2.2- that the expressions		

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8.2.1.1 Total Body Dose Rate (All Release Points)	<b></b>	<u> </u>
$\sum_{i} V_{i}Q_{i}_{pv} + \sum_{i} K_{i} \left[ \left( \overline{X/Q} \right)_{cv} Q_{i}_{cv1} + \left( \overline{X/Q} \right)_{vv} Q_{i}_{vv1} + \left( \overline{X}/Q \right)_{vv1} \right]$	$\overline{K/Q}$ ) _{ev} Q _i	$+ (\overline{X/Q})_{VV}$
$Q_{i_{vv2}} + (\overline{X/Q})_{tv} Q_{i_{tv2}} + (\overline{X/Q})_{cb} Q_{i_{cb2}} + (\overline{X/Q})_{dv} Q_{i_{dv}}$	$+(\overline{X/Q})$	wv Q _i ]
≤ 500 mrem/yr		[2.2-3]
8.2.1.2 Skin Dose Rate (All Release Points)		
$\sum_{i} \left[ L_{i}(\overline{X/Q})_{pv} + 1.1B_{i} \right] Q_{i_{pv}} + \sum_{i} \left[ L_{i} + 1.1M_{i} \right] [(\overline{X/Q})$	$ev Q_{i_{ev2}} +$	$+ (\overline{X/Q})_{VV} Q_{i_{VV}} +$
$(\overline{X/Q})_{cv} Q_{i_{cv2}} + (X/Q)_{vv} Q_{i_{vv2}} + (\overline{X/Q})_{tv} Q_{i_{tv2}}$	$+(\overline{X/Q})_{cb}$	$Q_{i_{cb2}} + (\overline{X/Q})_{dv}$
$Q_{i_{dv2}} + (\overline{X/Q})_{WV} Q_{i_{Wv2}} ] \le 3000 \text{ mrem/yr}$		[2.2-4]
where:		
$Q_{i_{pv}}$ = Release rate of radionuclide "i" from the PV	/-1/2, uCi/s	ec.
$Q_{i_{cv1}}$ = Release rate of radionuclide "i" from CV-1,	uCi/sec.	
$Q_{i_{cv2}}$ = Release rate of radionuclide "i" from CV-2,	uCi/sec.	
Q _i = Release rate of radionuclide "i" from VV-1	Auxiliary E	Building, uCi/sec.
$Q_{i_{vv2}}$ = Release rate of radionuclide "i" from VV-2,	uCi/sec.	
$Q_{i_{tv2}}$ = Release rate of radionuclide "i" from TV-2,	uCi/sec.	
$Q_{i_{cb}}$ = Release rate of radionuclide "i" from CB-2,	uCi/sec.	· · · · · · · · · · · · · · · · · · ·
$Q_{i_{dv2}}$ = Release rate of radionuclide "i" from DV-2,	uCi/sec.	

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Q _i wv2	= Release rate of radionuclide "i" from WV-2	2, uCi/sec.	; · · · ·
$(\overline{X/Q})_{pv}$	= Highest calculated annual average relative the PV- $1/2$ , sec/m ³ .	concentrati	ion for releases from
$(\overline{\mathrm{X/Q}})_{\mathrm{cv}}$	<ul> <li>Highest calculated annual average relative CV-1 and CV-2, sec/m³.</li> </ul>	concentrati	on for releases from
$(\overline{X/Q})_{vv}$	<ul> <li>Highest calculated annual average relative</li> <li>VV-1 and VV-2, sec/m³.</li> </ul>	concentrati	on for releases from
$(\overline{X/Q})_{tv}$	<ul> <li>Highest calculated annual average relative TV-2, sec/m³.</li> </ul>	concentrati	on for releases for
$(\overline{X/Q})_{cb}$	<ul> <li>Highest calculated annual average relative CB-2, sec/m³.</li> </ul>	concentrati	on for releases for
$(\overline{X/Q})_{dv}$	<ul> <li>Highest calculated annual average relative DV-2, sec/m³.</li> </ul>	concentrati	on for releases for
$(\overline{X/Q})_{wv}$	= Highest calculated annual average relative $WV-2$ , sec/m ³ .	concentrati	on for releases for
	ase rate for a containment purge is based on an ave e purge (not to exceed 960 min in accordance with	-	
All other	terms remain the same as those defined previous	ly.	
For the s	ite 4 notential modes of release are possible. The	reléase m	odes identify the

For the site, 4 potential modes of release are possible. The release modes identify the various combinations of sources of radioactivity and their release points which are used to determine the controlling locations. They are presented in ATTACHMENT C Table 2.2-1. For Release Modes 1, 2, and 3, the controlling location for implementation of ODCM CONTROL 3.11.2.1.a is 0.35 miles NW. Inserting the appropriate X/Q's from ATTACHMENT F Tables 2.2-4 through 2.2-10 for this location, Equations [2.2-3] and [2.2-4] become:

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#### 8.2.1.7 Determination of Controlling Location

The determination of controlling location for implementation of ODCM CONTROL 3.11.2.1.a for noble gases is a function of the following parameters:

- Radionuclide mix and their isotopic release rate
- Release Mode
- Meteorology

The incorporation of these 3 parameters into Equations [2.2-3] and [2.2-4] resulted in the equations for the controlling locations as presented in Equations [2.2-5 through 2.2-8].

The radionuclide mix used to determine controlling locations was based on source terms calculated with the Stone and Webster Engineering Corporation computer code GAS1BB (similar to NUREG-0017.^(3.1.3.4) Inputs were based on operating modes of the respective plants. The code inputs utilized are presented in 1/2-ODC-3.01. The source term is presented in ATTACHMENT D Tables 2.2-2a and 2.2-2b as a function of release type and Release Point.

The X/Q values utilized in the equations for implementation of ODCM CONTROL 3.11.2.1.a are based upon the maximum long-term annual average X/Q in the unrestricted area. ATTACHMENT E Table 2.2-3 presents the distances from the Release Points to the nearest unrestricted area for each of the 16 sectors as well as to the nearest vegetable garden, cow, goat, and beef animal. ATTACHMENT F Tables 2.2-4 through 2.2-10 present the long-term annual average (X/Q) values for all Release Points to the special locations presented in ATTACHMENT E Table 2.2-3. A description of their derivation is provided in 1/2-ODC-3.01.

For Release Modes 1, 2, and 3, dose calculations were performed using the highest calculated site boundary X/Q values applicable to the release points involved and the projected radionuclide mix applicable to the release source. In that a simultaneous, continuous elevated release could contribute to the dose at a given location, the selection of the two highest sector X/Q values at the site boundary considered this contribution. From these results, the distance and sector associated with the highest calculated site boundary dose were selected as the controlling location.

For Release Modes 1, 2, and 3 the controlling location is 0.35 miles NW. In Release Mode 1, the dominant release is via VV-1 and CV-2. In Release Modes 2 and 3, the dominant release is a Containment Purge from the VV-1 or VV-2.

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For Release Mode 4, a similar evaluation was performed. Long-term annual average X/Q values were calculated at the mid-point of the 10 standard distances listed in ATTACHMENT F Table 2.2-4 through 2.2-10. In that a simultaneous, ground level release could contribute to the dose at a given location, the selection of the two highest X/Q values at the controlling distance considered this contribution. Since the two maximum X/Q values occurred in the 0.5 - 1.0 mile radial band, the controlling distance was selected at 0.75 miles. From the calculated dose results, the controlling sector was shown to be North. In this Release Mode, the dominant release is a Containment Purge via the PV-1/2 Gaseous Waste/Process Vent. Neither of the controlling receptor locations are presently inhabited.

Values for K_i, L_i, and M_i, which were used in the determination of the controlling receptor location and which are to be used in Equations [2.2-5] through [2.2-8] to show compliance with ODCM CONTROL 3.11.2.1.2, are presented in Table 2.2-11. Values taken from Table B-1 of NRC Regulatory Guide 1.109, Revision 1,^(3.1.3.5) were multiplied by 1E6 to convert picocuries to microcuries for use in ATTACHMENT G Table 2.2-11.

Values for  $V_i$  and  $B_i$  for the finite plume model can be expressed as shown in Equation [2.2-9] and [2.2-10]. Values were calculated using the NRC code RABFIN at the site boundary location which would receive the highest total dose from all Release Points. These values are presented in ATTACHMENT G Table 2.2-12 and calculated from the following equation:

$$B_{i} = \frac{K}{r_{d}} \sum_{j} \sum_{k} \sum_{l} \frac{f_{jk} A_{li} u_{a} E_{l} I}{u_{j}}$$
[2.2-9]

where:

- I = The results of numerical integration over the plume spatial distribution of the airborne activity as defined by the meteorological condition of wind speed (u_j) and atmospheric stability class "k" for a particular wind direction.
- K = A numerical constant representing unit conversions.

 $= \frac{(260 \text{ mrad})(\text{radians}) \text{ (m}^3) \text{ (transformation)}}{(\text{sec})(\text{Mev})(\text{Ci})} \left[ \frac{16 \text{ sectors}}{2\pi \text{ radians}} \right]$ 

$$\left[1E - 6 \frac{Ci}{uCi}\right] \left[3.15E7 \frac{sec}{yr}\right]^{1/4}$$

- =  $2.1E4 \text{ mrad } (\text{m}^3) (\text{transformation})/\text{yr}(\text{Mev})(\text{uCi}).$
- $r_d$  = The distance from the release point to the receptor location, meters.

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	$u_j =$ The mean wind sp	peed assigned to the "j"	th wind speed	class, meters/sec.
	f _{jk} = The joint frequence stability class (dir	cy of occurrence of the nensionless).	"j" th wind sp	eed class and kth
	A _{li} = The number of ph emitted per transf	otons of energy corresp ormation of the "i" th ra		
,	$E_1$ = The energy assign	ned to the "l" th energy	group, Mev.	· · · · · · · · · · · · · · · · · · ·
	$u_a =$ The energy absorption	otion coefficient in air f	or photon ener	rgy H _i , meters ⁻¹ .
	The V _i factor is computed with o	conversion from air dos	e to tissue dep	th dose, thus:
	$V_{i} = 1.1 \frac{K}{r_{d}} \sum_{j} \sum_{k} \sum_{l} \frac{f_{jk} A_{li} u_{a} E}{u}$	$\frac{1}{1} \frac{I_{e} - u_{T} T_{d}}{I_{j}}$		[2.2-10]
	where:		۰.	ł
	$u_T$ = The tissue energy	absorption coefficient	for photons of	energy E ₁ , cm ² /gm.
	$T_d$ = The tissue density (5gm/cm ² ).	thickness taken to repr	esent the total	body dose
	1.1 = The ratio of the tis photons of interes	ssue to air absorption co t, mrem/mrad.	pefficients ove	r the energy range of
8.2.2	<u>Dose Rate Due To Radioiodine</u>	es And Particulates		
	The dose rate in unrestricted are radionuclides in particulate form released in gaseous effluents fro Based upon NUREG-0133, ^(3.1.3.1) with ODCM CONTROL 3.11.2.	n (excluding C-14) with m the site shall be limit the following basic ec	half lives greated to 1,500 m	ater than 8 days rem/yr to any organ.
	$\sum_{i} P_{it} \left[ (\overline{X/Q})_{s} Q_{is} + (\overline{X/Q})_{v} Q_{iv} \right]$	$\leq$ 1,500 mrem/yr		[2.2-11]
	where:			
	P _{it} = Dose paramete mrem/yr per u	er for any organ τ for ea Ci/m3.	ach identified r	adionuclide "i",

Q_{is} = The release rate of radionuclide "i", in gaseous effluents from elevated releases, uCi/sec.

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	Q _{iv} = The release rate of radionuclide "i", ir level releases, uCi/sec.	n gaseous effl	uents from ground	
	$(\overline{X/Q})_s$ = The highest calculated annual average unrestricted area boundary for elevate			
·	$(\overline{X/Q})_v$ = The highest calculated annual average unrestricted area boundary for ground		_	
	• NOTE: The dispersion parameters specified in site boundary as defined above.	n Section 8.2.	2 are limited to the	
	Releases may occur from any Release Point in the Release ATTACHMENT C Table 2.2-1. To show compliance v Equation [2.2-11] is now expressed in terms of the actua	with ODCM (	CONTROL 3.11.2.1.b	
	$\sum_{i} P_{i\tau} \left[ \left( \overline{X/Q} \right)_{pv} Q_{i}_{pv} + \left( \overline{X/Q} \right)_{cv} Q_{i}_{cv'} + \left( \overline{X/Q} \right)_{vv} Q_{i}_{cv'} \right]$	$P_{i} + (\overline{X/Q})$	$(i)_{cv} Q_{i_{cv^2}} + (\overline{X/Q})_{v}$	
	$(\overline{X/Q})_{tv} Q_{i_{tv^2}} + (\overline{X/Q})_{cb} Q_{i_{cb^2}} + (\overline{X/Q})_{dv} Q_{i_{dv^2}}$	$+(\overline{X/Q})_{WV}$	$\left[\frac{1}{100}\right] \le 1500 \text{ mrem}$	
	where:		[2.2-12]	
	$(\overline{X/Q})_{pv}$ = Highest calculated annual average relation from PV-1/2, sec/m ³ .	ative concenti	ration for releases	
	$(\overline{X/Q})_{cv}$ = Highest calculated annual average relation from CV-1 and CV-2, sec/m ³ .	ative concenti	ration for releases	
	$(\overline{X/Q})_{w}$ = Highest calculated annual average relation from VV-1 and VV-2, sec/m ³ .	ative concentr	ation for releases	
	$(\overline{X/Q})_{tv}$ = Highest calculated annual average relation from TV-2, sec/m ³ .	ative concent	ration for releases	
	$(\overline{X/Q})_{cb}$ = Highest calculated annual average relation from CB-2, sec/m ³ .	ative concent	ation for releases	

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	$(\overline{X/Q})_{dv}$ = Highest calculated annual average relation from DV-2, sec/m ³ .	tive concent	ration for releases	
	$(\overline{X/Q})_{wv}$ = Highest calculated annual average relat WV-2, sec/m ³ .	tive concent	ration for release from	
	Q _i = Long-term release rate of radionuclide	"i" from PV	-1/2, uCi/sec.	
	Q _i = Long-term release rate of radionuclide	"i" from CV	7-1, uCi/sec.	
	Q _i = Long-term release rate of radionuclide	"i" from CV	-2, uCi/sec.	
	Q _i = Long-term release rate of radionuclide	"i" from VV	-1, uCi/sec.	
	$Q_{i_{vv2}}$ = Long-term release rate of radionuclide	"i" from VV	7-2, uĆi/sec.	
	Q _i = Long-term release rate of radionuclide	"i" from TV	-2, uCi/sec.	<u>ہ</u>
	Q _i = Long-term release rate of radionuclide cb2	"i" from CB	-2, uCi/sec.	
	$Q_{i_{dv2}}$ = Long-term release rate of radionuclide	"i" from DV	7-2, uCi/sec.	
1	$Q_{i_{WV2}}$ = Long-term release rate of radionuclide	"i" from WV	/-2, uCi/sec.	
	All other terms are the same as those defined previously.			
~	TV-2, CB-2, DV-2 and WV-2 are not normal radioactive Points are included only for use if radioactive releases via future. In the calculation to show compliance with ODC inhalation pathway is considered.	a these vents	are identified in the	

Values of the organ dose parameters,  $P_{i\tau}$ , were calculated using methodology given in NUREG-0133.^(3.1.3.1) For the child age group, the following equation was used for all nuclides. The  $P_{i\tau}$ , values are presented in ATTACHMENT H Table 2.2-13.

 $P_{i\tau} = 3.79E9 \text{ DFA}_{i\tau}$ 

[2.2-13]

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where:	• • <i>,</i>		
3.7E9 = Breathing rate of child $(3,700 \text{ m}^3/\text{yr}) \times \text{un}$	it conversion fa	actor (1E6 pCi/uCi).	
DFA _{it} = The organ inhalation dose factor for a chi $0172$ , ^(3.1.3.6) for organ $\tau$ , nuclide "i", in un			
For Release Modes 1 through 4, the controlling locati NW.	on is the site bo	oundary, 0.35 miles	
Equation [2.2-12] becomes:	· 、		
$\sum_{i} P_{i\tau} [7.00E - 10Q_{i} + 9.24E - 5Q_{i} + 1.03E - 10Q_{i}]_{pv}$	$4Q_{i_{vv1}} + 7.3$	$5E - 5Q_{i_{tv1}} +$	
$9.24E - 5Q_{i}cv2 + 1.03E - 4Q_{i}vv2 + 7.35E - 5Q_{i}$	+ 7.35E - 5 tv2	5 Q _i + 9.24E -	
$5 Q_{i} + 9.24E - 5 Q_{i} ] \le 1500 \text{ mrem/yr}$		[2.2-14]	

#### 8.2.2.1 Determination of Controlling Location

The determination of the controlling location for implementation of ODCM CONTROL 3.11.2.1.b for radioiodines and particulates is a function of the same 3 parameters as for noble gases plus a fourth, the actual receptor pathways. The incorporation of these parameters into Equation [2.2-12] results in the respective equations for each Release Mode at the site boundary controlling locations. The radionuclide mix was again based upon the source terms presented in ATTACHMENT D Tables 2.2-2a and 2.2-2b as a function of release type and Release Point.

In the determination of the controlling site boundary for each Release Mode, the highest 2 site boundary X/Q values for each Release Point were utilized in conjunction with the radionuclide mix and the release rate for each Release Point to determine the controlling location.

The  $P_{i\tau}$  values are presented in ATTACHMENT H Table 2.2-13.

The X/Q values in Equation [2.2-14] were obtained from ATTACHMENT F Tables 2.2-4 through 2.2-10.

A description of the derivation of the X/Q values is provided in 1/2-ODC-3.01.

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# 8.3 <u>Compliance With 10 CFR 50 Dose Limits (ODCM CONTROLS 3.11.2.2 And 3.11.2.3)</u> (Gaseous)

At the Beaver Valley site all elevated gaseous releases are considered to originate from a shared radwaste system. The effluent from both units are mixed and discharged from a common Release Point, the PV-1/2 Gaseous Waste/Process Vent, at the top of the Unit 1 Cooling Tower. The resulting dose for the purpose of implementing 10 CFR 50 is normally apportioned equally to each unit. The only exception would be a Containment Purge via the Process Vent. The resulting dose shall be attributed to the contributing reactor unit. Since this operation is expected to be rare, equations are shown throughout this section with the apportionment set at 0.5.

### 8.3.1 Dose Due To Noble Gases

### 8.3.1.1 Cumulation Of Doses

Section II.B.1 of Appendix I of 10 CFR 50 (ODCM CONTROL 3.11.2.2) limits the releases of gaseous effluents from each reactor such that the estimated annual gamma air dose is limited to 10 millirad and the beta air dose is limited to 20 millirad. In addition, ODCM CONTROL 3.11.2.4 requires use of radwaste system if air doses when averaged over 31 days exceed 0.2 mrad for gamma and 0.4 mrad for beta. Based upon NUREG-0133,^(3.1.3.1) the air dose limits in the unrestricted area due to noble gases released in gaseous effluents are defined by the following equations:

#### 8.3.1.1.1 Gamma Radiation Quarter Limit

$$3.17E - 8\sum_{i} \left[ M_{i} \left[ \left( \overline{X/Q} \right)_{V} Q_{iV} + \left( \overline{X/q} \right)_{V} q_{iV} \right] + \left[ B_{i} Q_{iS} + b_{i} q_{iS} \right] \le 5 \text{ mrad} \qquad [2.3-1]$$

8.3.1.1.2 Beta Radiation Quarter Limit

$$3.17E - 8\sum_{i} N_{i} \left[ (\overline{X/Q})_{v} Q_{iv} + (\overline{X/q})_{v} q_{iv} + (\overline{X/Q})_{s} Q_{is} + (\overline{X/q})_{s} q_{is} \right] \le 10 \text{ mrad} [2.3-2]$$

8.3.1.1.3 Gamma Radiation Year Limit

$$3.17E - 8 \sum_{i} [M_{i}[(\overline{X/Q})_{V} Q_{iV} + (\overline{X/q})_{V} q_{iV}] + [B_{i}Q_{iS} + b_{i}q_{iS}]] \le 10 \text{ mrad}$$

8.3.1.1.4 Beta Radiation Year Limit  
3.17E - 8 
$$\Sigma$$
 N_i  $\left[ (\overline{X/Q})_{V} Q_{iV} + (\overline{X/q})_{V} q_{iV} + (\overline{X/Q})_{S} Q_{iS} + (\overline{X/q})_{S} q_{iS} \right] \le 20$ 

[2.3-4]

mrad

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8.	3.1.1.5	Gar	nma Radiation Projection Averaged Ov	er 31 Days	<u>ì</u>
· .	3.17E –	8ΣM	$\left[\left(\overline{X/Q}\right)_{V}Q_{iV} + \left(\overline{X/q}\right)_{V}q_{iV}\right] + \left[B_{i}Q_{iS} + b_{iV}Q_{iV}\right]$	$ q_{i_0}  \le 0.1$	2 mrad [2.3-5]
		i		1 15 2	
. 8.	3.1.1.6	Beta	a Radiation Projection Averaged Over	<b>31 Days</b>	
	3 17E - 3	85 N	$\left  \left( \overline{X/Q} \right)_{v} Q_{iv} + \left( \overline{X/q} \right)_{v} q_{iv} + \left( \overline{X/Q} \right)_{s} Q_{is} \right $	$+(\overline{X/a})$ a	s < 0.4  mrad [2.3-6]
	5.17L	i i		(204) _s 4	$[1]_{1}^{1} = 0.4 \text{ mad} [2.5 \circ 0]$
· .	where:		and the second		
	• . * • •	••			
•	M _i		he air dose factor due to gamma emissions dionuclide "i" (mrad/yr per uCi/m ³ ).	for each id	lentified noble gas
	Ni		he air dose factor due to beta emissions fo dionuclide "i" (mrad/yr per uCi/m ³ ).	r each ident	tified noble gas
	$(\overline{X/Q})_{v}$	= T	he annual average relative concentration for	or areas at c	or beyond the
· · · · · · · · · · · · · · · · · · ·	, · ·		restricted area boundary for long-term vers/year (sec/m ³ ).	nt releases g	greater than 500
	$(\overline{X/q})_{v}$	= T1	he relative concentration for areas at or be	yond the un	restricted area
			bundary for short-term vent releases equal $ec/m^3$ ).	to or less th	nan 500 hrs/year
	$(\overline{X/Q})_{s}$	= TI	he annual average relative concentration for	or areas at c	or beyond the
		ur	nrestricted area boundary for long-term fre an 500 hrs/year (sec/m ³ ).		•
: * e	$(\overline{X/q})_s$	= TI	ne relative concentration for areas at or be	vond the un	restricted area
	× 173		oundary for short-term free standing stack		
		hr	s/year (sec/m ³ ).		
•	$\mathbf{q}_{\mathbf{is}}$	= R	elease of noble gas radionuclide "i" in gas	eous effluer	nts for short-term
. •	ж.,	sta	ack releases equal to or less than 500 hrs/y	ear (uCi).	
	<b>q</b> iv		elease of noble gas radionuclide "i" in gase leases equal to or less than 500 hrs/year (u		nts for short-term ven
	Qis		elease of noble gas radionuclide "i" in gase anding stack releases greater than 500 hrs/		nts for long-term free
	Qiv		elease of noble gas radionuclide "i" in gase leases greater than 500 hrs/year (uCi).	eous effluer	nts for long-term vent

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B _i = The constant for long-term relea identified noble gas radionuclid from the elevated finite plume (i	e "i" accounting for th	hrs/year) for each		
b _i = The constant for short-term release each identified noble gas radion radiation from the elevated finite	uclide "i" accounting	for the gamma		
3.17E-8 = The inverse of the number of sec	conds in a year.			
NUREG 0133 ^(3,1,3,1) permits eliminating the sh meteorological terms in the determination of d sufficiently random in both time of day and du dispersion conditions. This special considerati [2,3-6], however, a summary of the "real time" corresponding releases shall be included in the Report.	loses when short-term tration to be represent ion is applied in Equa meteorological data	releases are ed by annual average tions [2.3-1] through coupled with the		
Short-term releases are also evaluated annually with XOQDOQ and GASPAR for inclusion in Report. The incorporation of this option and the Releas	the Annual Radiolog	ical Environmental HMENT I Table 2.3-1		
results in the following equations to show com quarter or year.	pliance with 10 CFR	50 for the calendar		
8.3.1.1.7 Gamma Radiation Dose Equation	<u>n</u>			
$3.17E - 8 \sum_{i} [M_{i} [(\overline{X/Q})_{cv} Q_{i} + (\overline{X/Q})_{vv} Q_{i}]$	$_{vv}$ + $(\overline{X/Q})_{cb}Q_{i_{cb}}$ +	$(\overline{X/Q})_{dv}Q_{i_{dv}} +$		
	•	[2.3-7]		
$(\overline{X/Q})_{WV}Q_{i_{WV}}] + 0.5B_{i}Q_{i_{pv}}]$				
$(\overline{X/Q})_{WV} Q_{i_{WV}} ] + 0.5 B_{i_{pv}} Q_{i_{pv}} ]$ $\leq 0.2 \text{ mrad (per 31 days), or}$ $\leq 5.0 \text{ mrad (per quarter), or}$ $\leq 10.0 \text{ mrad (per year)}$				
$\sim 0.2 \text{ mrad (per 31 days), or}$ $\leq 5.0 \text{ mrad (per quarter), or}$		 		
$\sim 0.2 \text{ mrad (per 31 days), or}$ $\leq 5.0 \text{ mrad (per quarter), or}$		  		

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8.3	3.1.1.8	Beta Radiation Dose Equa	<u>tion</u>		
	3.17E – 8 ∑ i	$N_{i}[(\overline{X/Q})_{cv}Q_{i_{cv}} + (\overline{X/Q})$	$vv^{Q}i_{vv} + (\overline{X/Q})_{Q}$	^b Q _i + 0	$(\overline{X/Q})_{dv}Q_{i_{dv}} +$
• •	:	$(\overline{X/Q})_{WV} Q_{i_{WV}} + 0.5 (\overline{X/Q})_{j}$	_{pv} Q _{i_{pv}} ]		[2.3-8]
	<u></u>	ad (per 31 days), or rad (per quarter), or rad (per year)			
	where:				
	$(\overline{X/Q})_{cv} =$	Annual average relative co (sec/m ³ ).	oncentration for rel	eases from	n CV-1 and CV-2
	$(\overline{X/Q})_{w} =$	Annual average relative co (sec/m ³ ).	oncentration for rel	eases from	n VV-1 and VV-2
	$(\overline{X/Q})_{pv} =$	Annual average relative co	oncentration for rel	eases fron	$1 \text{ PV-1/2 (sec/m^3)}.$
	$(\overline{X/Q})_{tv} =$	Annual average relative co	oncentration for rel	eases from	n TV-2 (sec/ $m^3$ ).
	Q _i =	Release of radionuclide "i'	' from CV-1 and C	2V-2 (uCi)	
	Q _{ivv} =	Release or radionuclide "i'	' from VV-1 and V	'V-2 (uCi)	
	Q _i =	Release of radionuclide "i'	' from PV-1/2 (uC	i) <i>.</i>	
	Q _i =	Release of radionuclide "i'	' from TV-2 (uCi).		
	Q _{icb} =	Release of radionuclide "i'	' from the CB-2 (u	Ci).	
i di seconda di second I seconda di	Q _i =	Release of radionuclide "i'	from DV-2 (uCi)		
	Q _i =	Release of radionuclide "i'	from WV-2 (uCi)	).	

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	Release Modes 1, 2, 3, and 4 the controlling loca e appropriate X/Q values into Equations [2.3-7]	· · · · · ·	NW. Substitution	
8.3.1.1.9	Gamma Radiation Dose Determination	<u>1</u>		
3.17	$E - 8 \sum_{i} [M_{i}] [9.24E - 5 Q_{i_{cv}} + 1.03E - 4 Q_{i_{vv}} + 1.03E - 4 Q_{i_{vv}}]$	$7.35E - 5 Q_{i_{tv}} +$	$+7.35E - 5Q_{i_{cb}} +$	
	$9.24E - 5Q_{i_{dv}} + 9.24E - 5Q_{i_{wv}}] + 0.51$	B _i Q _i ^{pv}	[2.3-9]	
<i>≤</i> 5.0	2 mrad (per 31 days), or ) mrad (per quarter), or 0 mrad (per year)			
8.3.1.1.1	0 Beta Radiation Dose Determination			
3.17	$E - 8 \sum_{i} N_{i} [9.24E - 5 Q_{i_{ev}} + 1.03E - 4 Q_{i_{vv}} + 7$	$V.35E - 5 Q_{i_{tv}} + 7$	$7.35E - 5 Q_{i_{cb}} +$	
	$9.24E - 5Q_{i_{dv}} + 9.24E - 5Q_{i_{wv}} + ($	0.5) 7.0E – 10 Q _i	] [2.3-10]	
$\leq 10.$	mrad (per 31 days), or 0 mrad (per quarter), or 0 mrad (per year)	: 1		
8.3.1.1.1	1 Determination of Controlling Location			
	The determination of the controlling loca 50 is a function of the following parameter	-	entation of 10 CFR	
	• Radionuclide mix and their isotopic r	elease		
	Release Mode			
^	Meteorology			
• •	The incorporation of these parameters int resulted in the equations for the controllin [2.3-9] and [2.3-10]. The radionuclide m calculated using the NRC GALE Code (s	ng locations as pr ix was based upo	esented in Equations n source terms	

calculated using the NRC GALE Code (see 1/2-ODC-3.01 for inputs) and are shown in ATTACHMENT D Tables 2.2-2a and 2.2-2b as a function of release type and Release Point.

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As in Section 8.2.1, for each Release Mode, the two highest boundary X/O values for each release point and release duration were utilized in conjunction with the radionuclide mix and release for each release point to determine the controlling site boundary location. Since elevated releases occur from the BVPS site and their maximum X/Q values may not decrease with distance (i.e., the site boundary may not have highest X/Q values), the two highest X/Qvalues for those distances, greater than the site boundary, were also considered in conjunction with the radionuclide mix to determine the controlling location. These values of X/Q were obtained for the midpoint of the 10 standard distance intervals previously presented in ATTACHMENT F Tables 2.2-4 through 2.2-10.

For each Release Mode, a particular combination of Release Point mix and meteorology dominates in the determination of the controlling location. For Release Modes 1, 2, 3, and 4 the controlling release is VV-1 and VV-2. For Release Mode 3, the controlling release is CV-1 and CV-2.

Values for M_i and N_i, which were used in the determination of the controlling location and which are to be used by BV-1 and BV-2 in Equations [2.3-9] and [2.3-10] to show compliance with 10 CFR 50 were presented in ATTACHMENT G Table 2.2-11. Values taken from Table B-1 of Regulatory Guide 1.109, Revision  $1^{(3.1.3.5)}$  were multiplied by 1E6 to convert from picocuries to microcuries for use in ATTACHMENT G Table 2.2-11.

In determination of the controlling location for Release Modes 1, 2, 3, and 4, ATTACHMENT F Tables 2.2-4 through 2.2-7 are utilized for X/Q values. The B_i values to be utilized are the same values which were presented in ATTACHMENT G Table 2.2-12. A description of the derivation of the various X/Q values is presented in 1/2-ODC-3.01.

The following relationship must hold for BV-1 or BV-2 to show compliance with ODCM CONTROL 3.11.2.2:

For The Calendar Quarter	
$D_{\gamma} \leq 5.0 \text{ mrad}$	 [2.3-11]
$D_{\beta} \leq 10 \text{ mrad}$	[2.3-12]
For The Calendar Year	
$D_{\gamma} \leq 10 \text{ mrad}$	[2.3-13]
$D_{\beta} \leq 20 mrad$	[2.3-14]

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		and the second	

where:

 $D_{y}$  = The air dose from gamma radiation (mrad).

 $D_{\beta}$  = The air dose from beta radiation (mrad).

The quarterly limits given above represent one-half the annual design objective of Section II.B.1 of Appendix I of 10 CFR 50. If any of the limits of Equations [2.3-11] through [2.3-14] are exceeded, a special report pursuant to both Section IV.A of Appendix I of 10 CFR 50 and ODCM CONTROL 3.11.2.2.a must be filed with the NRC at the identified locations.

In addition, ODCM CONTROL 3.1.2.4 requires that the gaseous radwaste system must be used to reduce radioactive materials in that waste when projected doses from each reactor unit when averaged over 31 days exceed any of the following:

 $D_{\gamma} \le 0.2 \text{ mrad}$  [2.3-15]

 $D_{\beta} \leq 0.4 \text{ mrad}$ 

#### 8.3.1.2 **Projection Of Doses (Noble Gas)**

Doses due to gaseous releases from BV-1 and BV-2 shall be projected at least once per 31 days in accordance with ODCM CONTROL 4.11.2.4 and this section. (Also see Section 8.3.2.2 <u>Projection Of Doses</u> for additional specifications). The Gaseous Radwaste Treatment System and the Ventilation Exhaust Treatment System shall be used to reduce radioactive materials in gaseous waste prior to their discharge in accordance with ODCM CONTROL 3.11.2.4 when the projected gaseous effluent air dose due to gaseous effluent releases from each reactor unit, when averaged over 31 days, would exceed 0.2 mrad for gamma radiation and 0.4 mrad for beta radiation. (Also see Section 8.3.2.2 <u>Projection Of Doses</u> for additional specifications). The doses used in the 31-day dose projection will be calculated using Equations [2.3-9] and [2.3-10] as appropriate. The 31-day dose projection shall be performed according to the following equations:

8.3.1.2.1

$$D_{31} = \left[\frac{A+B}{T}\right](31) + 0$$

[2.3-17]

[2.3-16]

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8.3.1.2.2 When Not Including Pre-Release Data	<b>_</b> ,	
$D_{31} = \left[\frac{A}{T}\right](31) + C$		[2.3-18]
where:		
$D_{31}$ = Projected 31 day dose (mrad).		
- A = Cumulative dose for quarter (mrad).		
B = Projected dose from this release (mr	ad).	
T = Current days into quarter.		
C = Value which may be used to anticipate the second sec	ate plant trends (r	nrad).
8.3.2 Dose Due To Radioiodines And Particulates		
8.3.2.1 <u>Cumulation Of Doses</u>		
Section II.C of Appendix I of 10 CFR 50 (ODC 3.11.2.4) limits the release of radioiodines and form from each reactor unit such that estimated individual in an unrestricted area from all path mrem to any organ. In addition, ODCM CON gaseous radwaste treatment system when the p releases from each reactor unit, when averaged to any organ. Based upon NUREG-0133, ^(3.1.3.1)	radioactive mate d dose or dose co ways of exposure TROL 3.11.2.4 re rojected dose due over 31 days, w	rial in particulate mmitment to an is not in excess of 1 equires the use of to gaseous effluent ould exceed 0.3 mren organ of an individual
from radioiodines and particulates, and radionu half-lives greater than 8 days in gaseous efflue		-

be determined by the following equation:

8.3.2.1.1 Radioiodines and Particulates Month, Quarter, and Year Limits

 $3.17E - 8 \sum_{i} R_{i\tau} [W_{s}Q_{is} + W_{s}q_{is} + W_{v}Q_{iv} + W_{v}q_{iv}]$ 

÷.,

 $\leq 0.3$  mrem (per 31 days), or

[2.3-19]

- $\leq$  7.5 mrem (per quarter), or
- $\leq 15.0$  mrem (per calendar year)

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	where:			
	where.			
	Qis	= Release of radionuclide "i releases greater than 500 h	-	n free standing stack
	Qiv	= Release of radionuclide "if than 500 hrs/yr (uCi).	' for long-terr	n vent releases great
	<b>q</b> is	= Release of radionuclide "i releases equal to or less th		-
	<b>q</b> iv	= Release of radionuclide "i' to or less than 500 hrs/yr (		m vent releases equa
	Ws	<ul> <li>Dispersion parameter for e the controlling location for releases greater than 500 h</li> </ul>	r long-term fr	
		= $sec/m^3$ for the inhalation p	athway, $(\overline{W/C})$	⊋)s.
		= meters ⁻² for the food and g	round plane p	bathway, $(\overline{D/Q})$ s.
	W _v	The dispersion parameter individual at the controllin releases greater than 500 h	g location for	
		= $sec/m^3$ for the inhalation p	athway, $(\overline{X/Q})$	)v.
		= meters ⁻² for the food and g	round plane p	bathway, $(\overline{D/Q})_{v}$ .
	Ws	<ul> <li>Dispersion parameter for e at the controlling location to or less than 500 hrs/yr.</li> </ul>		
<b>N</b>		= $sec/m^3$ for the inhalation p	athway, ( $\overline{W/q}$	)s.
		= meters ⁻² for the food and g	round plane p	bathway, $(\overline{D/q})_s$ .
	Wv	<ul> <li>The dispersion parameter f individual at the controllin releases equal to or less that</li> </ul>	g location for	
	• . •	= sec/m ³ for the inhalation particular sector =	athway, $(\overline{X/q})$	) _v .
		= meters ⁻² for the food and g	round plane p	eathway, $(\overline{D/q})_v$ .

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The inverse of the number of seconds in a year. 3.17E-8 =

The dose factor for each identified radionuclide "i" for the R_{iτ} organ " $\tau$ " of interest (mrem/yr per uCi/sec per m⁻² or mrem/yr per  $uCi/m^3$ ).

Radionuclides and particulates may be released from any of the BV-1 and BV-2 Release Points in the Release Modes identified in ATTACHMENT I Table 2.3-1. As described previously in Section 8.3.1.1, NUREG 0133^(3.1.3.1) permits. use of long-term annual average dispersion calculations (which with the release modes of Table 2.3-1 results in the following equations) to show compliance with ODCM CONTROLS 3.11.2.3 and 3.11.2.4. For a particular organ, Equation [2.3-19] becomes:

#### 8.3.2.1.2 **Radioiodines and Particulates Dose Equation**

$$3.17E - 8 \sum_{i} R_{i\tau} [0.5 W_{pv}Q_{i} + W_{cv}Q_{i} + W_{vv}Q_{i} + W_{tv}Q_{i} + W_{cb}Q_{i} + W_{cb}Q_{i} + W_{dv}Q_{i} + W_{wv}Q_{i} ]$$

$$[2.3-20]$$

 $\leq$  0.3 mrem (per 31 days), or

 $\leq$  7.5 mrem (per quarter), or

 $\leq 15.0$  mrem (per calendar year)

where:

Q

0.5

W_{cv} Dispersion parameter for releases from CV-1 and CV-2.

The value of

W_{vv} Dispersion parameter for releases from VV-1 and VV-2.

W_{tv} Dispersion parameter for releases from TV-2.

Wch Dispersion parameter for releases from CB-2.

W_{dv} Dispersion parameter for releases from DV-2.

Wwv Dispersion parameter for releases from WV-2.

Release of radionuclide "i" from PV-1/2 (uCi).

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$Q_{i_{cv}} = Release of radionuclion$	de "i" from CV-1	
Q _i = Release of radionuclic vv	de "i" from VV-1	and VV-2 (uCi).
$Q_{i_{tv}} = Release of radionuclion$	de "i" from TV-2	(uCi).
$Q_{i_{cb}} = Release of radionuclion$	de "i" from CB-2 (	(uCi).
$Q_{i_{dv}} = Release of radionuclic$	de "i" from DV-2	(uCi).
$Q_{i_{wv}} = Release of radionuclion$	le "i" from WV-2	(uCi).
TV-2, CB-2, DV-2 and WV-2 are not n These are included only for use if a rad future.	•	
In determining the dose at a particular I function of the pathway. For the food a of D/Q. If the inhalation pathway is con Incorporation of the various pathways i following equation for a particular orga	and ground plane p	pathway, W is in terms terms of X/Q.
8.3.2.1.2.1 Radioiodines and Particulates I	Dose Determinati	ion
$3.17E - 8 \sum_{i} [[R_{i\tau_{G}} + R_{i\tau_{M}} + R_{i\tau_{V}} + ]]$	$R_{i\tau_B}$ ][0.5 $W_{pv}Q$	$i_{pv} + W_{cv}Q_{i_{cv}} +$
$W_{vv}Q_{i_{vv}} + W_{tv}Q_{i_{tv}} + W$	$W_{cb}Q_{i_{cb}} + W_{dv}Q_{v}$	$Q_{i_{dv}} + W_{wv}Q_{i_{wv}}$
+ $R_{i\tau_1} [0.5 (X/Q)_{pv} Q_{i_{pv}}$		
$(X/Q)_{tv}Q_{i_{tv}} + (X/Q)_{cb}Q_{cb}$	$Q_{i_{cb}} + (X/Q)_{dv}$	$Q_{i_{dv}} + (X/Q)_{WV}]$
Q. 1	.` <b>`</b>	[2.3-21]

[2.3-21]

 $\leq$  0.3 mrem (per 31 days), or  $\leq$  7.5 mrem (per quarter), or  $\leq$  15.0 mrem (per year)

 $Q_{i_{wv}}$ ]

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	where:		;		
	R =	Dose facto	or for an organ	"τ" for radionucli	de "i" for the groun
	$R_{i\tau_G} =$			(mrem/yr per uCi	-
	$R_{i\tau_M} =$	Dose facto	or for an organ	"τ" for radionucli	de "i" for either the
		cow milk o	or goat milk pa	athway (mrem/yr)	per uCi/sec per m ⁻² )
-	$R_{i\tau_y} =$	Dose facto	or for an organ	"τ" for radionucli	de "i" for the
		vegetable	pathway (mrer	n/yr per uCi/sec p	$er m^{-2}$ ).
	R :_ =	Dose facto	or for an organ	"τ" for radionucli	de "i" for the meat
	īτ _B			Ci/sec per m ⁻² ).	
	D —				de "i" for the
	$R_{i\tau_i} =$		•	" $\tau$ " for radionucli	
		innalation	painway (mrei	m/yr per uCi/m ³ ).	
	It should be n [2.3-21] are in			$V_{tv}, W_{cp}, W_{dv}, and$	W _{wv} in Equation
		$3.^{(3.1.3.1)}$ The		ulated using the m nations were used	
8.3.2.1.2.2	Dose F	actors For I	nhalation Pat	<u>hway</u>	
a ser en	$R_{i\tau_1} = K'(E)$	BR)a(DFAit)a	1		
	= mrem/	/yr per uCi/m	<b>3</b>		[2.3-22]
· · · · · · · · · · · · · · · · · · ·	where:				
	К′	= A cons	tant of unit co	nversion (1E6 pC	i/uCi).
	(BR) _a	= The br	eathing rate of	the receptor of ag	ge group "a" (m ³ /yr)
	(DFA _{iτ} ) _a	group ' dose fa are giv	'a" for the "i" the totors (DFA _{it} ) en in Table E- Rev. 1 ^(3.1.3.5) o	h radionuclide (n by organ for the	he receptor of age arem/pCi). Inhalatio various age groups Regulatory Guide a 8 of NUREG-

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	The breathir as given in 7	ng rates (BR)a used for the variou Fable E-5 of the Regulatory Guid	s age group e 1.109. ^{(3.1.3}	os are tabulated below,
• •	Age Group(	a) Breathing Rate (m ³ /yr)		
	Infant	1400		
	Child	3700		
	Teen	8000		
-	Adult	8000		
8.3.2.1.2.	3 Dose	Factors For Ground Plane Path	<u>way</u>	
	$R_{i\tau_G} = K' R_{i\tau_G}$	$\zeta''$ (SF)DFG _{it} [(1 - e ^{-$\lambda$} i ^t )/ $\lambda_i$ ]		
	$= m^2 - m^2$	nrem/yr per uCi/sec		[2.3-23]
	where:	•		
	K'	= A constant of unit convers	ion (1E6 p0	Ci/uCi).
	Κ″	= A constant of unit convers	ion (8760 h	nr/year).
	λί	= The decay constant for the	"i" th radio	onuclide (sec ⁻¹ ).
	t	= The exposure time $(4.73E)$	8 sec or 15	years).
	DFG _{it}	<ul> <li>The groundplane dose con the "i" th radionuclide (mr of DFG_i, values is presente Guide 1.109.^(3.1.3.5)</li> </ul>	em/hr per p	Ci/m ² ). A tabulation
~	SF	<ul> <li>The shielding factor (dime 0.7 as suggested in Table I used.^(3.1.3.5)</li> </ul>		-
		· ·		
А.				

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8	3.2.1.2.4	Dose Fa	acto	<u>rs For Cow Milk or Goat M</u>	lilk Pathw	vay		
	• • • • •	$R_{i\tau_M} = K$	$\frac{Q_{I}}{\lambda_{i}}$	$\frac{f(U_{ap})}{f(t)}F_{m}(r)(DFL_{i\tau})_{a}\left[\frac{f_{p}f_{s}}{Y_{p}}+\frac{f_{p}}{f_{s}}\right]$	$\frac{\left(1-f_{p}f_{s}\right)e}{Y_{s}}$	$\frac{-\lambda i^{t}h}{dt} e^{-\lambda} i^{t}f$		
	•	= m	n ² -n	nrem/yr per uCi/sec		[2.3-24]		
	-	where:						
	-	K′	=	A constant of unit conversion	on (1E6 pC	Ci/uCi).		
		QF	_	The animal's consumption r	ate, wet w	eight (kg/day).		
		$U_{ap}$	=	The receptor's milk consum	ption rate,	for age "a" (liters/yr		
	·	Yp	=	The agricultural productivit grass (kg/m2).	y by unit a	rea of pasture feed		
		Ys	=	The agricultural productivit (kg/m2).	y by unit a	rea of stored feed		
		F _m	=	The stable element transfer	coefficien	ts (days/liter).		
	.*	<b>I</b>	=	Fraction of deposited activit grass.	ty retained	on animals feed		
		(DFL _{iτ} ) _a	=	The maximum organ ingesti radionuclide for the receptor Ingestion dose factors (DFI are given in Table E-11 thro $1.109^{(3.1.3.5)}$ or Tables 1 thro	r in age gr L _{iτ} ) _a for the ough E-14	oup "a" (mrem/pCi). e various age groups of Regulatory Guide		
		λ _i	=	The decay constant for the	"i" th radio	onuclide (sec-1).		
		$\lambda_{\mathbf{w}}$	=	The decay constant for remo		• •		
	•.	· .		surfaces by weathering 5.73 day half-life).	E-7 sec ⁻ (	corresponding to a 1		
		t _f	=	The transport time from pas receptor (sec).	ture, to an	imal, to milk, to		
		t _h	=	The transport time from pas milk, to receptor (sec).	ture, to ha	rvest, to animal, to		
		$\mathbf{f}_{p}$	=	Fraction of the year that the (dimensionless).	animal is	on pasture		

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		Fraction of the animal feed unimal is on pasture (dime		ure grass while the		
		e the parameter values use tory Guide 1.109. ^(3.1.3.5)	d for cow's r	nilk and their		
	Parameter	Value	Value RG. 1.1			
	r (dimensionless)	1.0 for radioiodine	E-15			
		0.2 for particulates	E-15	E-15		
	F _m (days/liter)	each stable element	E-1 (cow milk) E-2 (goat milk)			
	U _{ap} (liters/yr) - infant	330	E-5			
	child	330	E-5			
	teen	400	E-5			
	adult	310	E-5			
	$(DLF_{i\tau})_a$ (mrem/pCi)	each radionuclide	E-11 t	E-11 to E-14		
·	$Y_p (kg/m^2)$	0.7	E-15	E-15		
	$Y_s (kg/m^2)$	2.0	E-15	E-15		
	t _f (seconds)	1.73E5 (2 days)	E-15	E-15		
	t _h (seconds)	7.78E6 (90 days)	E-15	E-15		
·	Q _F (kg/day)	50	E-3	E-3		
· .	f _p	0.5				
÷	f _s	1.0				
	For goat's mills all values	remain the same except f	or On which	is 6 ka/day		

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			L~	
8.3.2.1	1.2.5 <u>Dose Factors</u>	For Meat Pathway		
	$R_{i\tau_{B}} = K' \frac{Q_{F} \left( U_{aF} \right)}{\lambda_{i} + \lambda_{v}}$	$\frac{f_{p}}{V}F_{f}(r)(DFL_{i\tau})_{a}\left[\frac{f_{p}f_{s}}{Y_{p}}+\right]$	$\frac{\left(1 - f_p f_s\right)}{Y_s}$	$\frac{e^{-\lambda_i t_h}}{e} = -\lambda_i t_f$
·		L		L
	$= m^2 - mrem/yr$	per uCi/sec		[2.3-25]
-	where:			
	$F_f$ = The stable	element transfer coefficien	nts (days/kg	g).
· · ·	$U_{ap}$ = The recept	or's meat consumption rate	for age "a	" (kg/yr).
	$t_f = The average (sec).$	ge time from slaughter of m	leat animal	l to consumption
	$t_h = The transp$	ort time from crop field to	receptor (s	ec).
	-	e the same as the milk path		-
	which is obtained from	Table E-1.Parameter tf isble E-5.These values, as of	obtained fi	rom Table E-15, and
	which is obtained from U _{ap} is obtained from Ta	Table E-1.Parameter tf isble E-5.These values, as of	obtained fi obtained fr	rom Table E-15, and
	which is obtained from $U_{ap}$ is obtained from Ta 1.109, ^(3.1.3.5) are as follo	Table E-1. Parameter t _f is ble E-5. These values, as c ws:	obtained fi obtained fr	rom Table E-15, and om Regulatory Guid
	which is obtained from U _{ap} is obtained from Ta 1.109, ^(3.1.3.5) are as follo Parameter	Table E-1. Parameter t _f is         ble E-5. These values, as one         ws:         Value	obtained fi obtained fr R	rom Table E-15, and om Regulatory Guid
	which is obtained from $U_{ap}$ is obtained from Ta 1.109, ^(3.1.3.5) are as follo <u>Parameter</u> $F_f$ (days/kg) $t_f$ (seconds)	Table E-1. Parameter t _f is         ble E-5. These values, as over the second stable element         Value         each stable element	obtained from the second secon	rom Table E-15, and om Regulatory Guid
	which is obtained from $U_{ap}$ is obtained from Table 1.109, ^(3.1.3.5) are as follo <u>Parameter</u> $F_f$ (days/kg) $t_f$ (seconds) $U_{ap}$ (kg/yr) - infant	Table E-1. Parameter t _f is         ble E-5. These values, as over the second stable         Walue         each stable element         1.73E6 (20 days)	obtained from btained from E-1 E-15	rom Table E-15, and om Regulatory Guid
	which is obtained from Table 1.109, ^(3.1.3.5) are as follo Parameter $F_f$ (days/kg) $t_f$ (seconds) $U_{ap}$ (kg/yr) - infant Child	Table E-1. Parameter t _f is ble E-5. These values, as constant         Value         each stable element         1.73E6 (20 days)         0	obtained from btained from E-1 E-15 E-5	rom Table E-15, and om Regulatory Guid
	which is obtained from $U_{ap}$ is obtained from Table 1.109, ^(3.1.3.5) are as follo <u>Parameter</u> $F_f$ (days/kg) $t_f$ (seconds) $U_{ap}$ (kg/yr) - infant	Table E-1. Parameter t _f is ble E-5. These values, as constant         Value         each stable element         1.73E6 (20 days)         0         41	obtained from botained from E-1 E-15 E-5 E-5	rom Table E-15, and om Regulatory Guid
	which is obtained from Table 1.109, ^(3.1.3.5) are as follo Parameter $F_f$ (days/kg) $t_f$ (seconds) $U_{ap}$ (kg/yr) - infant Child Teen Adult Man is considered to co	Table E-1. Parameter t _f is ble E-5. These values, as o ws: <u>Value</u> each stable element 1.73E6 (20 days) 0 41 65	ebtained from btained from E-1 E-15 E-5 E-5 E-5 E-5 E-5 E-5 n (fresh ar	rom Table E-15, and om Regulatory Guid <u>CG-1.109 Table</u> ad stored) that differ
	which is obtained from Table 1.109, ^(3.1.3.5) are as follo Parameter $F_f$ (days/kg) $t_f$ (seconds) $U_{ap}$ (kg/yr) - infant Child Teen Adult Man is considered to co	Table E-1. Parameter t _f is ble E-5. These values, as constrained with the second stable element         value         each stable element         1.73E6 (20 days)         0         41         65         110         nsume 2 types of vegetatio	ebtained from btained from E-1 E-15 E-5 E-5 E-5 E-5 E-5 E-5 n (fresh ar	rom Table E-15, and om Regulatory Guid <u>CG-1.109 Table</u> ad stored) that differ
	which is obtained from Table 1.109, ^(3.1.3.5) are as follo Parameter $F_f$ (days/kg) $t_f$ (seconds) $U_{ap}$ (kg/yr) - infant Child Teen Adult Man is considered to co	Table E-1. Parameter t _f is ble E-5. These values, as constrained with the second stable element         value         each stable element         1.73E6 (20 days)         0         41         65         110         nsume 2 types of vegetatio	ebtained from btained from E-1 E-15 E-5 E-5 E-5 E-5 E-5 E-5 n (fresh ar	rom Table E-15, and om Regulatory Guid <u>CG-1.109 Table</u> ad stored) that differ

Title: ODCM: GASEOUS EFFLUENTS 8.3.2.1.2.6 <u>Dose Factors For Vegetation Pathwa</u> (r)	1/2-ODC-2.02       Unit:     Level Of Use:       1/2     In-Field Reference       Revision:     Page Number:       2     62 of 130
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Г 7	av
(r) [ T	
$R_{i\tau_{v}} = K' \left[ \frac{(r)}{Y_{v} (\lambda_{i} + \lambda_{w})} \right] (DFL_{i\tau})_{a} \left[ U_{a}^{L} f_{L} e \right]$	$\left[ e^{-\lambda_i t} L + U_a^S f_g e^{-\lambda_i t} h \right]$
$= m^2$ -mrem/yr per uCi/sec	[2.3-26]
where:	
$\vec{K}' = A \text{ constant of unit conversion (1E6)}$	5 pCi/uCi).
$U_a^L$ = The consumption rate of fresh leafy group "a" (kg/yr).	y vegetation by the receptor in age
$U_a^S$ = The consumption rate of stored vegetat "a" (kg/yr).	tion by the receptor in age group.
$f_L$ = The fraction of the annual intake of locally.	f fresh leafy vegetation grown
$f_g$ = The fraction of the annual intake of	f stored vegetation grown locally.
$t_L$ = The average time between harvest c consumption (seconds).	of leafy vegetation and its
t _h = The average time between harvest or consumption (seconds).	of stored vegetation and its
$Y_v$ = The vegetation area density (kg/m ² )	·).
all other factors are defined previously.	
	· · · · · · · · · · · · · · · · · · ·
	:

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· · · · · · · · · · · · · · · · · · ·	Tabulated below are the Regulatory Guide 1.10	ne appropriate parameter v )9. ^(3.1.3.5)	alues and th		
	Parameter	Value	RG	-1.109 Table	
	r (dimensionless)	1.0 for radioiodines	E-15		
	, (, ,	0.2 for particulates	E-15		
	(DFL _{it} ) _a (mrem/pCi)	each stable element	E-11 to	E-14	
-	$U_a^L$ (kg/yr) - infant	0	E-5		
	Child	26	E-5		
	teen	42	E-5		
	adult	64	E-5		
	$U_a^S$ (kg/yr) - infant	0	E-5		
	child	520	E-5		
	toon	630	E-5		
. •	adult	520	E-5		
	$f_L$ (dimensionless)	1.0	E-15		
• • <u>•</u> • • •	Fg (dimensionless)	0.76	E-15		
	t _L (seconds)	8.6E4 (1 day)	E-15		
	t _h (seconds)	5.18E6 (60 days)	E-15		
	$Y_{V} (kg/m^{2})$	2.0	E-15		

As discussed in Section 8.2.2 for tritium, the parameter W for the food pathway is based upon X/Q. The ground plane pathway is not appropriate for tritium. Therefore, the left-hand portion of Equation [2.3-20] may be expressed for purposes of implementation of 40 CFR 190, discussed in 1/2-ODC-2.04, as follows:

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	8.3.2.1.2.7	Tritium Dose Equation	· · · · · · · · · · · · · · · · · · ·	<u> </u>
	3.17E - 8	$(R_{T\tau_{M}} + R_{T\tau_{V}} + R_{T\tau_{B}} + R_{T\tau_{I}})$	$[0.5(X/Q)_{pv}Q_{T_{pv}}]$	+ $(X/Q)_{cv} Q_{T_{cv}}$ +
	(X/Q) _{VV} Q	$Q_{T_{vv}} + (X/Q)_{tv} Q_{T_{tv}} + (X/Q)_{cb} Q_{\tau}$	$+ (X/Q)_{dv} Q_{\tau_{dv}}$	+ $(X/Q)_{WV} Q_{\tau_{WV}}$ ]
		· · · · · · · · · · · · · · · · · · ·		[2.3-27]
	where:			
	$R_{T\tau_M} =$	Dose factor for organ " $\tau$ " for triticular uCi/m ³ ).	m for the milk pathv	vay (mrem/yr per
	$R_{T\tau_V} =$	Dose factor for organ " $\tau$ " for tritiuuCi/m ³ ).	im for the vegetable j	oathway (mrem/yr pe
	$R_{T\tau_B} =$	Dose factor for organ "τ" for tritiu uCi/m ³ ).	m for the beef pathw	ay (mrem/yr per
	$R_{T\tau_{I}} =$	Dose factor for organ " $\tau$ " for tritiuuCi/m ³ ).	m for the inhalation	pathway (mrem/yr p
	Equation [2 ODC-2.04	2.3-27] is used to show compliance	with 40 CFR 190, as	discussed in 1/2-
		ntration of tritium in milk is based of $\Gamma_M$ is based on [X/		tration rather than t
. •	8.3.2.1.2.8	Tritium Dose Factors For M	<u>ilk Pathway</u>	
•.	$R_{T\tau_M} = K$	'K" F _m Q _F U _{ap} (DLF _{iτ} ) _a [0.75(0.5/H)	1	
		em/yr per uCi/m ³		[2.3-28]
•	where:			
,	K" =	A constant of unit conversion (100	00 gm/kg).	
	H =	Absolute humidity of the atmosph		
	0.75 =	The fraction of total feed that is w	ater.	
	0.5 =	The ratio of the specific activity of water.	f the feed grass water	to the atmospheric

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and other parameters and values are the same as for  $R_{i\tau_M}$ .

The concentration of tritium in vegetation is based on the airborne concentration rather than the deposition. Therefore, the  $R_{t\tau_v}$  is based on [X/Q]:

## 8.3.2.1.2.9 Tritium Dose Factors For Vegetation Pathway

$$R_{T\tau_{V}} = K'K'' \left[ U_{a}^{L} f_{L} + U_{a}^{S} f_{g} \right] \left( DFL_{i\tau} \right)_{a} \left[ 0.75(0.5/H) \right]$$
  
= mrem/vr per uCi/m³

where all terms have been defined above.

The concentration of tritium in meat is based on its airborne concentration rather than the deposition. Therefore, the  $R_{T\tau_B}$  is based on [X/Q]:

[2.3-29]

[2.3-30]

## 8.3.2.1.2.10 Tritium Dose Factors For Beef Pathway

$$R_{T\tau_{B}} = K'K''F_{f}Q_{F}U_{ap}(DFL_{i\tau})_{a} [0.75(0.5/H)]$$

= mrem/yr per uCi/m³

where all terms have been defined above.

To show compliance with ODCM CONTROLS 3.11.2.3 and 3.11.2.4, Equation [2.3-21] is evaluated at the controlling pathway location. For Release Modes 1 through 4, the controlling location is a residence 0.89 miles in the NW sector. Inserting appropriate X/Q values from ATTACHMENT F Tables 2.2-4 to 2.2-10 and D/Q values from ATTACHMENT L Tables 2.3-28 to 2.3-34, Equation [2.3-21] becomes:

## .3 Radioiodines and Particulates Dose Determination

 $3.17E - 8 \sum_{i} [[R_{i\tau_{c}} + R_{i\tau_{v}}]](0.5)4.22E - 10 Q_{i_{pv}} + 1.56E - 8 Q_{cv} + 1.56E - 8 Q_{cv}]$ 

 $Q_{i_{vv}} + 1.55E - 8Q_{i_{tv}} + 1.55E - 8Q_{i_{cb}} + 1.56E - 8Q_{i_{dv}} + 1.56E - 8Q_{i_{dv}}$ 

 $Q_{i_{wv}}] + R_{i\tau_{I}}[(0.5) 7.30E - 9 Q_{i_{pv}} + 2.00E - 5 Q_{i_{cv}} + 2.71E - 5 Q_{i_{vv}}]$ 

+  $2.22E - 5Q_{i_{tv}} + 2.22E - 5Q_{i_{cb}} + 2.00E - 5Q_{i_{dv}} + 2.00E - 5Q_{i_{wv}}$ ]

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• • •	$\leq$ 7.5 mrem (per quarter), or	an tha	[2.3-31]	
	For tritium, for purposes of implementation of 1/2-ODC-2.04, Equation [2.3-28] reduces to:	40 CFR 19	0, as discussed in	
	$3.17E - 8[R_{T\tau_v} + R_{T\tau_i}][(0.5)7.30E - 9Q_{i_{pv}}]$	+ 2.00E -	$5 Q_{i_{cv}} + 2.71E -$	
-	$5Q_{i_{vv}} + 2.22E - 5Q_{i_{tv}} + 2.22E - 2Q_{i_{tv}} + 2.22E $	5 Q _{icb} + 2.4	00E-5Q _{idv} +	
	2.00E – 5 Q _{iwv} ]	•.	[2.3-32]	
8.3.2.1.4	<b>Determination of Controlling Location</b>			

The determination of a controlling locating for implementation of ODCM CONTROLS 3.11.2.3 and 3.11.2.4 for radioiodines and particulates is a function of:

- Radionuclide mix and their isotopic release
- Release Mode
- Meteorology
- Exposure pathway
- Receptor's age

The incorporation of these parameters into Equation [2.3-19] results in the respective equations for each Release Mode at the controlling location.

In determination of the controlling location for each Release Mode, the radionuclide mix of radioiodines and particulates was based upon the source terms calculated using the GALE code. This mix was presented in ATTACHMENT D Tables 2.2-2a and 2.2-2b as a function of Release Mode and Release Point. For the ground plane exposure pathway, all radionculides (excluding H-3 and C-14) were considered in determination of the controlling location. For the inhalation and food pathways H-3 and C-14 were also considered in determination of the controlling location.

In determination of the controlling location for each Release Mode, all of the exposure pathways, as presented in ATTACHMENT E Table 2.2-3, were evaluated. These include cow milk, goat milk, beef and vegetable ingestion and inhalation and ground plane exposure. An infant was assumed to be present at all milk pathway locations. A child was assumed to be present at all vegetable garden and beef animal locations. The ground plane and inhalation exposure pathways were considered to be present at all locations.

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For determination of the controlling location, the highest D/Q and X/Q values for each Release Point and Release Mode for the vegetable garden, cow milk, and goat milk pathways were selected. The organ dose was calculated at each of these locations using the radionuclide mix and Release Points of ATTACHMENT D Tables 2.2-2a and 2.2-2b Based upon these calculations, it was determined that the controlling location for Release Modes 1 through 4 is the residence (vegetable garden)/child pathway.

For Release Modes 1 through 4, the controlling Release Point and mix is VV-1 and VV-2.

ATTACHMENT J Tables 2.3-2 through 2.3-20 present Ri values for the total body, GI-LLI, bone, liver, kidney, thyroid, and lung organs for the ground plane, inhalation, cow milk, goat milk, vegetable, and meat ingestion pathways for the infant, child, teen, and adult age groups as appropriate to the pathways. These values were calculated using the methodology described in NUREG- $0133^{(3.1.3.1)}$  using a grazing period of 6 months.

In determination of the controlling location for Release Modes 1-4, ATTACHMENT F Tables 2.2-4 through 2.2-10 are utilized for X/O's, and ATTACHMENT L Tables 2.3-28 through 2.3-34 are utilized for long term D/Q values. A description of the derivation of the various X/Q and D/Q values is presented in 1/2-ODC-3.01.

Long-term D/Q values for PV-1/2, CV-1, CV-2, VV-1, VV-2, TV-2, CB-2, DV-2 AND WV-2 are provided for the midpoints of the following distances:

0.0-0.5 mi., 0.5-1.0 mi., 1.0-1.5 mi., 1.5-2.0 mi., 2.0-2.5 mi., 2.5-3.0 mi., 3.0-3.5 mi., 3.5-4.0 mi., 4.0-4.5 mi., 4.5-5.0 mi.

The values appear in ATTACHMENT K Tables 2.3-21 through 2.3-27. These values may be utilized if an additional special location arises different from those presented in the special locations of ATTACHMENT E Table 2.2-3.

The following relationship must hold for BV-1 or BV-2 to show compliance with ODCM CONTROL 3.11.2.3.

For The Calendar Quarter:

 $D_{\tau} < 7.5$  mrem to any organ

[2.3-33]

For The Calendar Year:

 $D_{\tau} < 15$  mrem to any organ



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where:

 $D_{\tau}$  = The dose to any organ from radioiodines and particulates (mrem).

The quarterly limits given above represent one-half the annual design objective of Section II.C of Appendix I of 10 CFR 50. If any of the limits of Equations [2.3-33] and [2.3-34] are exceeded, a Special Report pursuant to both Section IV.A of Appendix I of 10 CFR 50 and ODCM CONTROL 3.11.2.3.a must be filed with the NRC at the identified locations.

## 8.3.2.2 Projection Of Doses (Radioiodines And Particulates)

Doses due to gaseous releases from BV-1 or BV-2 shall be projected at least once per 31 days in accordance with ODCM CONTROL 4.11.2.4 and this section. (Also see Section 8.3.1.2, <u>Projection Of Doses</u> for additional specifications). The appropriate portions of the Ventilation Exhaust Treatment System shall be used to reduce radioactive materials in gaseous waste prior to their discharge in accordance with ODCM CONTROL 3.11.2.4 when the projected doses due to gaseous effluent releases from each reactor unit, when averaged over 31 days, would exceed 0.3 mrem to any organ. (Also see Section 8.3.1.2, <u>Projection Of Doses</u> for additional specifications). Doses resulting from the gaseous effluent release of radioiodines and particulates will be calculated for use in the 31-day dose projection using Equation [2.3-31]. The 31-day dose projection shall be performed according to the following equations:

8.3.2.2.1

When Including Pre-Release Data,

$$D_{31} = \left[\frac{A+B}{T}\right](31)$$

[2.3-35]

**8.3.2.2.2** 

When Not Including Pre-Release Data,

$$D_{31} = \left[\frac{A}{T}\right](31) + C$$

[2.3-36]

where:

 $D_{31}$  = Projected 31 day dose (mrem).

A = Cumulative dose for quarter (mrem).

B = Projected dose for this release (mrem).

T = Current days into quarter.

C = Value which may be used to anticipate plant trends (mrem).

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## 8.4 Gaseous Radwaste System

The gaseous radwaste system has the capability to control, collect, process, store, recycle, and dispose of gaseous radioactive waste generated as a result of plant operations, including anticipated operational occurrences.

A simplified flow diagram of the gaseous radwaste system for BV-1 and BV-2 is provided as ATTACHMENT N Figure 2.4-1. A diagram showing the gaseous effluent Release Points is provided as ATTACHMENT P Figure 2.4-2. Since the concept of a shared gaseous radwaste system is used, then gaseous waste generated can be stored, processed, and discharged from either BV-1 or BV-2.

## 8.4.1 BV-1 Gaseous Radwaste System Components

## 8.4.1.1 BR-1EV-2A/2B: Degasifiers

There are two Degasifiers. They are designed to continuously process reactor coolant letdown for reducing entrained noble gases in the liquid.

## 8.4.1.2 <u>GW-1E-1A/1B: Waste Gas Chillers</u>

There are two Chillers. Non-condensable gases from the degasifiers are directed by system pressure to the Waste Gas Chillers.

## 8.4.1.3 GW-1TK-3A thru 3D: Gaseous Waste Charcoal Delay Beds

There are four Charcoal Beds. The dry effluent from the Chillers is directed to the Waste Gas Charcoal Delay Beds for holdup of xenon and krypton and adsorption of radioiodines. When four beds are operated in series, they provide a holdup of xenon isotopes for about 30 days.

## 8.4.1.4 GW-1FL-5A/5B: Overhead Gas Compressor Prefilters

There are two Prefilters. The gaseous effluent (primarily hydrogen) is directed from the Gaseous Waste Charcoal Delay Beds to one of the Overhead Gas Compressor Prefilters. The filters remove carbon solids from the gas stream.

## 8.4.1.5 <u>GW-1C-1A/1B: Gas Compressors</u>

There are two Compressors. The waste gas enters one of the compressors after passing through the Prefilters.

## 8.4.1.6 <u>GW-1TK-2: Gaseous Waste Surge Tank</u>

There is one Surge Tank. It has a capacity of 52 cuft. After compression to about 65 psig, the waste gas is sent to the Surge Tank. This can be done automatically or manually.



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## 8.4.1.7 <u>GW-1TK-1A thru 1C: Waste Gas Decay Tanks</u>

There are three Decay Tanks. Each has a capacity of 132 cuft. The contents of the Surge Tank is transferred to the Decay Tanks for storage and decay. After 30 days of storage, all xenon and iodine should have decayed, and the resulting predominant nuclide should be krypton 85.

## 8.4.1.8 RM-1GW-108 And RM-1GW-109: Gaseous Effluent Radiation Monitors

There are redundant Radiation Monitors on the combined PV-1/2 Gaseous Waste/Process Vent release path. These Radiation Monitors continuously analyze gaseous waste as it is being discharged. Gaseous Monitor RM-1GW-108B is an offline gamma scintillator, while RM-1GW-109 Channel 5 is an off-line beta scintillator. The upper activity alarm on the gaseous Channels of these Radiation Monitors have setpoints that would indicate we are approaching the Total Body Dose Rate or Skin Dose Rate limits for radioactive gas leaving the site. If an upper activity alarm on RM-1GW-108B is received, it automatically terminates the discharge by closing an isolation valve downstream of the Decay Tanks.

## 8.4.2 BV-2 Gaseous Radwaste System Components

## 8.4.2.1 **2BRS-EV21A/21B: Degasifiers**

There are four Degasifiers (two at Unit 1 and two at Unit 2). They are designed to continuously process reactor coolant letdown for reducing entrained noble gases in the liquid.

## 8.4.2.2 2GWS-E21A/21B: Waste Gas Chillers

There are four Chillers (two at Unit 1 and two at Unit 2). Non-condensable gases from the degasifiers are directed by system pressure to the Waste Gas Chillers.

## 8.4.2.3 2GWS-TK22A thru 22D: Waste Gas Charcoal Delay Beds

There are four Charcoal Beds (four at Unit 1 and four at Unit 2). The dry effluent from the Chillers is directed to the Waste Gas Charcoal Delay Beds for holdup of xenon and krypton and adsorption of radioiodines. When four beds are operated in series, they provide a holdup of xenon isotopes for about 30 days.

## 8.4.2.4 2GWS-FLT24A/24B: Overhead Gas Compressor Prefilters

There are two Prefilters. The gaseous effluent (primarily hydrogen) is directed from the Waste Gas Charcoal Delay Beds to one of the Overhead Gas Compressor Prefilters. The filters remove carbon solids from the gas stream.

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## 8.4.2.5 2GWS-C21A/21B: Gas Compressors

There are two Compressors. The waste gas enters one of the compressors after passing through the Prefilters.

## 8.4.2.6 2GWS-TK21: Gaseous Waste Surge Tank

There is one Surge Tank. It has a capacity of 52 cuft. After compression to about 65 psig, the waste gas is sent to the Surge Tank. This can be done automatically or manually.

## 8.4.2.7 2GWS-TK25A thru 25G: Gaseous Waste Storage Tanks

There are seven Storage Tanks. Each has a capacity of 132 cuft. The contents of the Surge Tank is transferred to the Storage Tanks for storage and decay. After 30 days of storage, all xenon and iodine should have decayed, and the resulting predominant nuclide should be krypton 85.

## 8.4.2.8 RM-1GW-108 And RM-1GW-109: Gaseous Effluent Radiation Monitors

Previously described in Section 8.4.1.

- END -

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			GASEOUS SO		н. 10		
			OVPTOOP PO	UKCL ILKW			
				:*•	the work of the first		
			TABLE	21-12			
			1ADDD	2.1-14	Star Francis	. L	
		<b>BV-1 RADION</b>		COP GASEOU	C EECT LIENITC	1	
		DV-I KADION			S EFFLUENTS		
		c.	(Ci/	yr)			
			•		·		
	-	DV					
		RX CONTAINMENT/	AUXILIARY BUILDING		:.		
		SLCRS VENT	VENT	CASEOUS	WASTE/PROCES	O MENT	
		Long Term, And		<u> </u>	WASTE/PROCES	55 VENI	
		Long Term, And					
			AUXILIARY	MAIN	CONTAINMEN		
	(2)	CONTAINMENT	-	CONDENSER/	VACUUM	WASTE	
	NUCLIDE ⁽²⁾	BUILDING ⁽¹⁾	VENTILATION	AIR EJECTOR	PUMPS ⁽³⁾	<u>SYSTEM</u>	
		Short Term	Long Term	Long Term	Long Term	Short Term	
			•		et i i		
	Kr-83m	2.2E-02	4.2E-01	2.7E-01	5.2E-03	0.0	
	Kr-85m	1.5E-01	1.9E+00	1.2E+00	5.5E-02	7.3E-02	
	Kr-85	6.1E+01	2.5E+00	1.6E+00	1.0E+01	2.3E+02	÷
	Kr-87	5.4E-02	1.3E+00	-8.2E-01	1.1E-02	0.0	
	Kr-88	2.4E-01	3.8E+00	2.4E+00	7.0E-02	0.0	
	Kr-89 Xe-131m	4.7E-04 7.4E-01	1.2E-01	7.7E-02	4.3E-05	0.0	
			1.3E-01	8.0E-02 5.6E-01	1.8E-01	1.3E+00	
	Xe-133m Xe-133	8.9E-01 8.9E+01	8.9E-01 3.6E+01	2.3E+01	3.1E-01 2.7E+01	0.0 2.3E+01	
	Xe-135 Xe-135m	4.5E-03	3.2E-01	2.0E-01	6.2E-04	0.0	
	Xe-135m Xe-135	4.5E-05 7.0E-01	4.5E+00	2.8E+00	0.2E-04 2.7E-01	0.0	
		1.0E-01	2.1E-01	1.3E-01	8.8E-05	0.0	
	xe-14/		1.1E+00	6.6E-01	1.7E-03	0.0	
	Xe-137 Xe-138	1 5E-02		0.000-01		0.0	
	Xe-137 Xe-138 Ar-41	1.5E-02 2.5E+01	0.0	0.0	0.0	0.0	

⁽²⁾ Source Term from BVPS-2 UFSAR Table 11.3.1^(3.1.1.2)

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⁽³⁾ Original Source Term from Calculation No. UR(B)-262 was adjusted for a factor of 14 increase in pump flowrate due to installation of high capacity pumps during 1R15. This change in Source Term is documented in Condition Report CR03-04830 and Calculation No. ERS-HHM-87-014.

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		Beaver Va	alley Powe	r Station		1/2-ODC	
Ti	tle:				Un		
		· · · · · · · · · · · · · · · · · · ·					eld Reference
0	DCM: GA	SEOUS EFFLU	JENTS		Rev	vision: Page Num 2 7	
	· · · · ·				·	2 /	<u>3 of 130</u>
			A	TTACHMENT Page 2 of 2	A		
	· .		GASE	OUS SOURCE	TERM		
				TABLE 2.1-1b			
		BV-2 I	RADIONUCLIE	E MIX FOR GA	<b>ASEOUS EFFL</b>	LUENTS	
				(Ci/yr)			
			· · · ·				
				· · · · ·			
		SLCRS	SLCRS	TURBINE			
	s in singer	UNFILTERED	FILTERED	BUILDING	<u>.</u>		
		PATHWAY	<u>PATHWAY</u>	<u> </u>	GASEOU	S WASTE/PROCE	SS VENT
		Long Term, And	••	:			
	2	$(x_{1},\ldots,x_{n}) \in \mathcal{F}_{1}$	AUXILIARY	TURBINE	MAIN	CONTAINMEN	
		CONTAINMENT	BUILDING	BUILDING	CONDENSER/	VACUUM	WASTE
Ī	NUCLIDE ⁽²⁾	BUILDING ⁽¹⁾	<b>VENTILATION</b>	<b>VENTILATION</b>	AIR EJECTOR	PUMPS ⁽³⁾	SYSTEM
		Short Term	Long Term	Long Term	Long Term	Long Term	Short Tern
	Kr-83m	4.0E-05	4.2E-01	3.9E-05	2.7E-01	3.7E-04	0.0
	<r-85m< td=""><td>1.4E-02</td><td>1.9E+00</td><td>1.7E-04</td><td>1.2E+00</td><td>3.9E-03</td><td>1.2E-02</td></r-85m<>	1.4E-02	1.9E+00	1.7E-04	1.2E+00	3.9E-03	1.2E-02
	<r-85< td=""><td>6.1E+01</td><td>2.5E+00</td><td>2.3E-04</td><td>1.6E+00</td><td>7.2E-01</td><td>2.3E+02</td></r-85<>	6.1E+01	2.5E+00	2.3E-04	1.6E+00	7.2E-01	2.3E+02
	<r-87< td=""><td>5.3E-06</td><td>1.3E+00</td><td>1.1E-04</td><td>8.2E-01</td><td>7.8E-04</td><td>0.0</td></r-87<>	5.3E-06	1.3E+00	1.1E-04	8.2E-01	7.8E-04	0.0
	Kr-88	4.1E-03	3.8E+00	3.5E-04	2.4E+00	5.0E-03	0.0
	Kr-89	0.0	1.2E-01	1.1E-05	7.7E-02	3.1E-06	0.0
	Ke-131m	7.2E-01	1.3E-01	1.2E-05	8.0E-02	1.3E-02	8.3E-01
	Ke-133m	7.6E-01	8.9E-01	8.1E-05	5.6E-01	2.2E-02	0.0
	Ke-133	8.4E+01	3.6E+01	3.4E-03	2.3E+01	1.9E-00	8.2E+00
	Ke-135m	0.0	3.2E-01	2.9E-05	2.0E-01	4.4E-05	0.0
	Ke-135	2.4E-01	4.5E+00	4.2E-04	2.8E+00	1.9E-02	0.0
2	Ke-137	0.0	2.1E-01	2.1E-05	1.3E-01	6.3E-06	0.0
2		0.0	1.1E+00	9.7E-05	6.6E-01	1.2E-04	0.0
2 2 2	(e-138 Ar-41	0.0 2.5E+01	0.0	0.0	0.0	0.0	0.0

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Pathway), or PV-1/2 (Gaseous Waste/Process Vent)
 ⁽²⁾ Source Term from BVPS-2 UFSAR Table 11.3.2^(3.1.2.3)
 ⁽³⁾ Source Term from Calculation No. UR(B)-262^(3.1.2.5)

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	Beaver V	alley Pow	er Station		Procedure Number:	ODC-2.02
Title:	· - · ·				والتعيينية ومبركي بمكر وعنوا فيهرد فالبها	vel Of Use:
				1	1/2	In-Field Reference
	<b>ASEOUS EFFL</b>	LIENITS		ក		ge Number:
	ASEOUS EFFE				2	74 of 130
			ATTACHMEN	ТВ		4 · · · · · · · · · · · · · · · · · · ·
			Page 1 of 2			
	GASEO	IS FEEL LENT	MONITOR DE	TECTION FEI	TOENCIES	
	UABLU	US EFFLUENT	MONTOR DL	TECTION EF	TCIENCIES	
			TABLE 2.1-2	)a		
			111DLU 2.1-2	za		
		BV-1 MONIT	OR DETECTO	R FFFICIENCI	FS	
					(LO	
			(cpm/uCi/cc	)		
			1. S.			
			GASEOUS			NTAINMENT/
<u>NUCLIDE</u>		JILDING VENT		SS VENT		CRS VENT
	PRIMARY	ALTERNATE	PRIMARY	ALTERNATE	PRIMARY	
	MONITOR ⁽¹⁾	MONITOR ⁽²⁾	MONITOR ⁽¹⁾	MONITOR ⁽²⁾	MONITOR ⁽	¹⁾ MONITOR ⁽²⁾
	RM-VS-101B	RM-VS-109	RM-GW-108B	RM-GW-109	RM-VS-107	B RM-VS-110
		Channel 5		Channel 5	۰.	Channel 5
Kr-83m						
Kr-85m	 9.80 E7	2.39 E7	9.00 E7	2.43 E7	5.16 E7	2.57 E7
Kr-85	3.88 E5	2.47 E7	3.56 E5	2.51 E7	5.04 E7	2.67 E7
Kr-87	7.38 E7	2.95 E7	6.78 E7	3.00 E7	9.60 E7	3.19 E7
Kr-88	1.14 E8	2.11 E7	1.05 E8	2.14 E7	5.16 E7	2.28 E7
Kr-89	1.39 E8	2.93 E7	1.28 E8	2.98 E7	9.59 E7	3.16 E7
Kr-90	1.34 E8	3.05 E7	1.23 E8	3.10 E7	9.87 E7	3.29 E7
Xe-131m	2.25 E6	1.56 E7	2.07 E6	1.59 E7	2.94 E7	1.68 E7
Xe-133m	1.26 E7	1.94 E7	1.16 E7	1.97 E7	4.17 E7	2.09 E7
Xe-133	1.01 E7	1.24 E7	9.24 E6	1.26 E7	2.28 E7	1.33 E7
Xe-135m	7.15 E7	5.70 E6	6.58 E7	5.80 E6	1.51 E7	6.15 E6
Xe-135	1.12 E8	2.91 E7	1.03 E8	2.96 E7	6.42 E7	3.14 E7
Xe-137	3.16 E7	2.96 E7	2.91 E7	3.01 E7	1.05 E8	3.19 E7
Xe-138	1.15 E8	2.66 E7	1.06 E8	2.70 E7	7.35 E7	2.87 E7
Ar-41	7.17 E7	3.00 E7	6.59 E7	3.05 E7	7.19 E7	3.23 E7

installation factors. (Pressure corrections are not required for the SPING Monitors.) See Calculation Package ERS-SFL-85-031 for additional information.^(3.1.1.4)

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Be	eaver Valley	Power Sta	tion	Procedure Num	nber: /2-ODC-2.02
litle:				Unit:	Level Of Use:
1999 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 -				1/2	In-Field Reference
ODCM: GASEC	DUS EFFLUENTS	5	<b>N</b> 1	Revision: 2	Page Number: 75 of 130
		ATTACI	IMENT B		
		Page	2 of 2		2
	GASEOUS EFF		OR DETECTION	EFFICIENCI	ES
		TADI			
	DUA		E 2.1-2b		
	BV-2		ECTOR EFFICIE	NCIES	
		(cpm/	′uCi/cc)	•	
	*	• .			
	SLCRS	SLCRS	WASTE GAS		CONDENSATE
ν.	UNFILTERED	FILTERED	STORAGE	DECON	POLISHING
NUCLIDE ⁽¹⁾	<b>PATHWAY</b>	<b>PATHWAY</b>	VAULT VENT	<b>BUILDING V</b>	ENT BUILDING VEN
18	2HVS-RQ101B	2HVS-RQ109B	2RMQ-RQ303B	2RMQ-RQ30	1B 2HVL-RQ112B
Kr-83m			<b></b>	·	
Kr-85m	3.20E7	5.83E7	3.20E7	3.20E7	3.20E7
Kr-85	3.60E7	7.19E7	3.60E7	3.60E7	3.60E7
Kr-87	3.73E7	8.85E7	3.73E7	3.73E7	3.73E7
Kr-88	3.05E7	6.80E7	3.05E7	3.05E7	3.05E7
Kr-89	3.72E7	8.73E7	3.72E7	3.72E7	3.72E7
Kr-90	3.86E7	8.80E7	3.86E7	3.86E7	3.86E7
Xe-131m	2.44E7	4.61E4	2.44E7	2.44E7	2.44E7
Xe-133m	2.86E7	6.06E4 .	2.86E7	2.86E7	2.86E7
Xe-133	1.80E7	2.94E7	1.80E7	1.80E7	1.80E7
Xe-135m	7.22E6	1.55E4	7.22E6	7.22E6	7.22E6
Xe-135	3.86E7	7.48E7	, 3.86E7	3.86E7	3.86E7
Xe-137	3.78E7	9.07E7	3.78E7	3.78E7	3.78E7
Xe-138	3.52E7	7.74E7	3.52E7	3.52E7	3.52E7
Ar-41	3.79E7	7.90E7	3.79E7	3.79E7	3.79E7

Efficiencies from Calculation Package ERS-SFL-86-026.^(3.1.2.1)

and a second				
Beaver V	alley Power S	tation	Procedure Num 1/	ber: 2-ODC-2.02
Title:		······································	Unit: 1/2	Level Of Use: In-Field Reference
ODCM: GASEOUS EFFLU	UENTS		Revision:	Page Number: 76 of 130
		CHMENT C age 1 of 1		<i>id di 150</i>
		ASEOUS RELEA	SE	
	T SEOUS RELEASE F IPLEMENTATION			ENTS FOR
RELEASE POINT	RELEASE MODE 1	RELEASE MODE 2	RELEASE MODE 3	RELEASE MODE 4
RP 1; VV-1, Aūxiliary Building Vent ⁽¹⁾	Aux. Bldg. Ventilation	Containment Purge ⁽³⁾	Same As Mode	1 Same As Mode 1
RP 2; CV-1, Rx Containment/SLCRS Vent ⁽¹⁾	Leakage Collection Exhaust	Same As Mode 1	Same As Mode and Containmen Purge ⁽³⁾	
RP 3; PV-1/2, Gaseous Waste/Process Vent ⁽²⁾	Main Cond. Air Ejector, Waste Gas, Containment Vacuum	Same As Mode 1	Same As Mode	Same As Mode 1 and Containment Purge
RP 4; VV-2 SLCRS Unfiltered Pathway ⁽¹⁾	Contiguous Areas	Containment Purge ^{(3):}	Same As Mode	Same As Mode 1
RP 5; CV-2, SLCRS Filtered Pathway Vent ⁽¹⁾	Aux. Bldg. Ventilation	Same As Mode 1	Same As Mode 1 and Containmen Purge ⁽³⁾	
RP 6; CB-2, Condensate Polishing Bldg Vent ⁽¹⁾	(4)	(4)	(4)	. (4)
RP 7; WV-2, Waste Gas Storage Vault Vent ⁽¹⁾	(4)	(4)	(4)	(4)
RP 8; DV-2, Decontamination Bldg Vent ⁽¹⁾	(4)	(4)	(4)	(4)
RP 9; TV-2, Turbine Bldg Vent ⁽¹⁾	(4)	(4)	(4) .	(4)
· · · · ·	· .			

NOTE: For the purpose of implementing 10 CFR 50, batch discharges may use continuous meteorology since short term meteorology is used at the time of the annual report.

⁽¹⁾ Continuous ground level meteorology is applicable

⁽²⁾ Continuous elevated meteorology is applicable

⁽³⁾ Mode established by purge from one unit, all other release points remain same as Mode 1

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⁽⁴⁾ Not normally a radioactive release point

## Beaver Valley Power Station

Procedure Number: 1/2-ODC-2.02 Level Of Use: Unit: In-Field Reference 1/2Revision: Page Number: 2 77 of 130

**ODCM: GASEOUS EFFLUENTS** 

Title:

## ATTACHMENT D Page 1 of 2 RADIONUCLIDE MIX

e 5. - .

## TABLE 2.2-2a **BV-1 RADIONUCLIDE MIX FOR GASEOUS EFFLUENTS** (Ci/yr)

•	RX	1. N. 1.	·		
· ·	CONTAINMENT/	AUXILIARY		*	
	<b>SLCRS VENT</b>	BUILDING VENT	GASEC	US WASTE/PROCES	SS VENT
and the second second	Long Term, And	· · · · · · · · · · · · · · · · · · ·	······································	,, <u>, , , , , , , , , , , , , , , , , ,</u>	
· . · ·	$\Delta = \Delta A$ (1.1)	AUXILIARY	MAIN	CONTAINMENT	•.
	CONTAINMENT	BUILDING	CONDENSER/	VACUUMM	GASEOUS
NUCLIDE ⁽²⁾	BUILDING ⁽¹⁾	VENTILATION	AIR EJECTOR	PUMPS ⁽³⁾	WASTE SYSTEM
	Short Term	Long Term	Long Term	Long Term	Short Term
Kr-83m	2.2E-02	4.2E-01	2.7E-01	5.2E-03	0.0
Kr-85m	1.5E-01	1.9E+00	1.2E+00	5.5E-02	1.2E-02
Kr-85	6.1E+01	2.5E+00	1.6E+00	1.0E+01	2.3E+02
Kr-87	5.4E-02	1.3E+00	8.2E-01	1.1E-02	0.0
Kr-88	2.4E-01	3.8E+00	2.4E+00	7.0E-02	0.0
Kr-89	4.7E-04	1.2E-01	7.7E-02	4.3E-05	0.0
Xe-131m	7.4E-01	1.3E-01	8.0E-02	1.8E-01	8.3E-01
Xe-133m	8.9E-01	8.9E-01	5.6E-01	3.1E-01	0.0
Xe-133	8.9E+01	3.6E+01	2.3E+01	2.7E+01	8.2E+00
Xe-135m	4.5E-03	3.2E-01	2.0E-01	6.2E-04	0.0
Xe-135	7.0E-01	4.5E+00	2.8E+00	2.7E-01	0.0
Xe-137	1.0E-03	2.1E-01	1.3E-01	8.8E-05	0.0
Xe-138	1.5E-02	1.1E+00	6.6E-01	1.7E-03	0.0
I-131	1.2E-03	4.6E-02	2.1E-02	6.6E-03	0.0
I-132	0.0	0.0	0.0	3.5E-05	0.0
I-133	2.0E-04	6.7E-02	3.0E-02	1.2E-03	0.0
I-134	0.0	0.0	0.0	6.6E-06	0.0
I-135	0.0	0.0	0.0	2.0E-04	0.0
Co-58	7.5E-04	6.0E-02	0.0	2.2E-04	0.0
Co-60	3.4E-04	2.7E-02	0.0	1.0E-04	0.0
Mn-54	2.2E-04	1.8E-02	0.0	6.9E-05	0.0
Fe-59	7.5E-05	6.0E-03	0.0	2.2E-05	0.0
Sr-89	1.7E-05	1.3E-03	0.0	5.2E-06	0.0
Sr-90	3.0E-06	2.0E-04	0.0	9.2E-07	0.0
Cs-134	2.2E-04	1.8E-02	0.0	6.9E-05	0.0
Cs-137	3.8E-04	3.0E-02	0.0	1.2E-04	0.0
C-14	1.0E+00	0.0	0.0	0.0	7.0E+00
Ar-41	2.5E+01	0.0	0.0	0.0	0.0
			· · · · · · · · · · · · · · · · · · ·		

⁽¹⁾ Containment can be purged via VV-1 (Auxiliary Building Vent), CV-1 (Rx Containment/SLCRS Vent), or PV-1/2 (Gaseous Waste/Process Vent) Source Term from BVPS-2UFSAR Table 11.3-1^(3.1.1.2) See Note ⁽³⁾ from ATTACHMENT A Table 2.1-1a ^(3.1.1.5) ^(3.1.1.8) ^(3.1.3.10)

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(3)

# Beaver Valley Power

Title:

er Va	lley Powe	r Station	Proced	ure Numbe 1/2	r: -ODC-2.(	)2
			Unit: 1/		evel Of Use:	Reference
EFFLU	ENTS		Revisio 2		age Number:	f 130
BV-2 R.	RAI	TTACHMENT D Page 2 of 2 DIONUCLIDE MIX TABLE 2.2-2b E MIX FOR GASH (Ci/yr)		ENTS		
RS TERED WAY rm, And	SLCRS FILTERED PATHWAY	TURBINE <u>BUILDING VENT</u>	GASEOUS	WASTE	/PROCESS	<u>S VENT</u>
NMENT	AUXILIARY BUII DING	TURBINE	MAIN CONDENSER/			GASEOU

NUCLIDE ⁽²⁾	CONTAINMENT BUILDING ⁽¹⁾ Short Term	AUXILIARY BUILDING <u>VENTILATION</u> Long Term	TURBINE BUILDING <u>VENTILATION</u> Long Term	MAIN CONDENSER/ <u>AIR EJECTOR</u> Long Term	CONTAINMENT VACUUM PUMPS ⁽³⁾ Long Term	GASEOUS WASTE <u>SYSTEM</u> Short Term
K <b>r-8</b> 3m	4.0E-05	4.2E-01	3.9E-05	2.7E-01	3.7E-04	0.0
Kr-85m	1.4E-02	1.9E+00	1.7E-04	1.2E+00	3.9E-03	1.2E-02
Kr-85	6.1E+01	2.5E+00	2.3E-04	1.6E+00	7.2E-01	2.3E+02
Kr-87	5.3E-06	1.3E+00	1.1E-04	8.2E-01	7.8E-04	0.0
Kr-88	4.1E-03	3.8E+00	· 3.5E-04	2.4E+00	5.0E-03	0.0
Kr-89	0.0	1.2E-01	1.1E-05	7.7E-02	3.1E-06	0.0
Xe-131m	7.2E-01	1.3E-01	1.2E-05	8.0E-02	1.3E-02	8.3E-01
Xe-133m	7.6E-01	8.9E-01	8.1E-05	5.6E-01	2.2E-02	0.0
Xe-133	8.4E+01	3.6E+01	3.4E-03	2.3E+01	1.9E-00	8.2E+00
Xe-135m	0.0	3.2E-01	2.9E-05	2.0E-01	4.4E-05	0.0
Xe-135	2.4E-01	4.5E+00	4.2E-04	2.8E+00	1.9E-02	0.0
Xe-137	0.0	2.1E-01	2.1E-05	1.3E-01	6.3E-06	0.0
Xe-138	0.0	1.1E+00	9.7E-05	6.6E-01	1.2E-04	0.0
I-131	2.7E-05	4.6E-03	6.5E-04	2.1E-02	4.7E-04	0.0
I-132	0.0	0.0	0.0	0.0	2.5E-06	0.0
I-133	2.6E-06	6.7E-03	8.7E-04	3.0E-02	8.4E-05	0.0
I-134	0.0	0.0	0.0	0.0	4.7E-07	0.0
I-135	0.0	0.0	0.0	0.0	1.4E-05	0.0
Co-58	7.5E-02	6.0E-04	0.0	0.0	1.6E-05	0.0
Co-60	3.4E-02	2.7E-04	0.0	0.0	7.4E-06	0.0
Mn-54	2.2E-02	1.8E-04	0.0	0.0	4.9E-06	0.0
Fe-59	7.5E-03	6.0E-05	0.0	0.0	1.6E-06	0.0
Sr-89	1.7E-03	1.3E-05	0.0	0.0	3.7E-07	0.0
Sr-90	3.0E-04	2.0E-06	0.0	0.0	6.6E-08	0.0
Cs-134	2.2E-02	1.8E-04	0.0	0.0	4.9E-06	0.0
Cs-137	3.8E-02	3.0E-04	0.0	0.0	8.4E-06	0.0
C-14	1.0E+00	0.0	0.0	0.0	0.0	7.0E+00
Ar-41	2.5E+01	0.0	0.0	0.0	0.0	0.0

(1) Containment can be purged via VV-2 (SLCRS Unfiltered Pathway), CV-2 (SLCRS Filtered Pathway), or PV-1/2 (Gaseous Waste/Process Vent)
 (2) Source Term from BVPS-2UFSAR Table 11.3-2^(3.1.1.3)

⁽³⁾ See Section 8.1.1.1

**ODCM: GASEOUS EFFLUENTS** 

SLCRS

UNFILTERED

PATHWAY

Long Term, And

	Bea	ver	٠V	all	ey	P	ow	/ei	r S	Stat	tio	n		ï			P	rocedu	ire Nui 1	mber: 1/2-ODC-	2.02	
Title: ODCM: G	• 5 ₆₁	<u></u>	· .	 -						i-		<u> </u>						nit: <u>1/2</u> evisio: 2	2	Level Of U In-Fie Page Numb	se: Id Referer	10
				÷	D	IST	AN		F	ACH Page TO 1	1 0	f 1			no	NTS	1			1	<u>, 01 130</u>	
	RESIDENT	D ELEV		2,295	2,461 790	1,562		1,922	1,650	1,961 1.628		2.423	1,466	2,439	2,463	3.635	3,590	1,383	662,1	s for ble to		
	, RESU	GROUND	• • •	2,527	2,639 708	708		756	1,577	1,835		2.189	1,223	2,221	2,301	3.556	3,605	1,432	1,140	Distance is applica		
POINTS	NIMAL	) ELEV		3,919	2,605 7 526			4,200	1,619	3,420 1.964		2,487	2,560	2,632	2,608	4.166	3,590	4,461 2 774	<b>1</b> // <del>1</del>	uildings. 1d release		
ELEASE	MEAT ANIMAL	GROUND		4,152	2,848 7 741			4,265	1,577	3,299 1.770		2.253	2,317	2,414	2,446	4.088	3,605	4,570	r.r.r.	ainment B /2. Groun	•	
RS TO RI	GOAT	ELEV	·	4,418	6,033 20,545	6,671		4,200	2,899	· 5,848 10.166		1	5,859	3,210	1	ł	22,507	16,832	202,01	V-2 Cont le to PV-1		
TABLE 2.2-3 DISTANÇES OF LIMITING MAXIMUM INDIVIDUAL RECEPTORS TO RELEASE POINTS > FOR ANNUAL X/Q VALUES (meters)	MILK GOAT	GROUND		4,651	6,276 20,760	6,824		4,265	2,865	5,729 9.977		1	5,616	2,993	1	ł	22,529	10,944	0.4.01	in the BV-1 and BV-2 Containment Buildings. Distances for elease is applicable to PV-1/2. Ground release is applicable to		
TABLE 2.2-3 XXIMUM INDIVIDUAL RECF FOR ANNUAL X/Q VALUES (meters)	MILK COW	ELEV		ł				6,998	1	5,848 5.244		3,539	3,590	ł	5,341	5.195	4,521		I	veen the B d release i		
TABLE 2.2 JM INDIVID NNUAL X/( (meters)	MILK	GROUND		ł	741			7,065	1	5,729 5.053		3,347			5,182	5.118	4,538	, <b>8</b>		point betv . Elevate		
MAXIMU FOR A	VEGETABLE GARDEN	D ELEV		2,423	2,461 901	1,658		1,922	1,619	1,961 1.933		3,372	2,560	2,439	2,463	3.635	3,590	1,415	C07'1	he center ing Tower		
BNITING	VEGEN GAR	GROUND	, ,	2,623	2,740 724	1,674		1,979	1,577	1,835		3,138	2,317	2,221	2,301	3.556	3,605	1,464 1 464	<b>1</b> 01	ed from t V-1 Cool	-2	
ES OF LI	DARY*	ELEV	·	413	632 327	394			672	815 912		1,054				681	676	482	077	re measur om the B	V-2, WV	
JISTANÇI	SITE BOUNDARY*	GROUND	(1) (2)		535 792 490 442					575 701 655 762		850 887	975 1,064	35 1,439	595 561	685 640	810. 701	655 567 645 558		releases a leasured fr s.	2, CV-2, D	
			IJ	Q,	<u>7</u> , 4	4		Ş.	S.	ο, <u>τ</u> ο		60	6	1,435	5.	. 39	00	ف ق	5	*Distances for ground releases are measured from the center point between the BV-1 and BV-2 Containment Buildings. Distances for elevated release is applicable to PV-1/2. Ground release is applicable t all other release points.	(1) TV-2 and CB-2 (2) VV-1, CV-1, VV-2, CV-2, DV-2, WV-2	
	GNIMNMOD	SECTOR		z	NNE NE	ENE		ជា	ESE	SE SSE		S	SSW	SW	WSW	A	MNW	NW NNW		Distances evated ru l other ru	) TV-2 a ) VV-1, (	

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Title:						Unit: 1/2	Level Of Use: In-Field Reference
ODCM: GAS	EOUS	EFFLUEN	NTS	·		Revision: 2	Page Number: 80 of 130
				TTACHMEN Page 1 of 7 SPERSION P.		S	
	LES	4.5- 5.0	2.280 1.560 1.230 1.060	0.726 0.517 0.649 0.563	0.848 1.020 1.800 3.090	5.550 12.200 16.700 5.660	
	DISTANCES TO THE CONTROL LOCATION, IN MILES	4.0-	2.660 1.830 1.450 1.260	0.859 0.612 0.768 0.665	0.999 1.190 2.110 3.620	6.460 14.200 19.400 6.560	
S	ATION	3.5-	3.480 2.190 1.910 1.880	1.040 0.815 0.931 0.803	1.200 1.580 2.790 4.650	7.660 20.700 28.200 8.350	
ATION	DL LOC	3.0- 3.5	4.240 2.690 2.370 2.340	1.300 1.020 1.160 0.997	1.490 1.940 3.430 5.690	9.320 25.000 34.000 10.100	-
DL LOC	ONTRO	2.5-	5.82 3.44 3.55 3.04	1.83 1.43 1.77 1.41	2.10 2.48 4.37 7.72	11.70 31.20 42.30 13.50	- 1
LE 2.2-4 AVERAGE, GROUND LEVEL, S RELEASES, SPECIAL DISTANCES 2.2-3), AND SELECTED CONTROL L 7 sec/m ³	THE C	2.0- 2.5	7.68 4.60 4.81 4.14	2.49 1.95 2.41 1.91	2.84 3.33 5.85 10.30	15.40 40.60 55.00 17.60	
UND LE CCIÀL I CTED C	CES TC	1.5-	11.80 6.62 6.99 5.70	3.65 3.10 3.54 3.30	4.11 4.80 9.94 14.60	31.00 59.20 79.80 26.20	
LE 2.2-4 AVERAGE, GROUND LEVEL, S RELEASES, SPECIAL DISTA 2.2-3), AND SELECTED CONTI 7 sec/m )	ISTAN	1.0-	18.70 10.80 11.60 9.55	6.08 5.16 5.89 5.46	6.77 7.83 16.10 23.50	49.00 92.10 123.00 40.80	
LE 2.2-4 AVERAGE S RELEAS S RELEAS (2-3), AND (2-3), AND (5 sec/m ³ )		0.5- 1.0	39.5 26.8 21.6 18.4	15.7 10.5 12.0 12.0	17.5 19.9 29.2 49.8	103.0 203.0 262.0 86.4	
TABLE 2.2-4 UAL AVERA UOUS RELE/ 3LE 2.2-3), A (1E-7 sec/m ³ )		0-0.5	233.0 148.0 120.0 103.0	89.5 59.1 65.9 67.2	99.9 110.0 160.0 283.0	615.0 1290.0 1710.0 547.0	
7 2 ANNU ONTINU DNTINU E, TAB		RESI- DENCE	13.50 7.16 49.10 42.20	32.60 6.92 6.70 9.01	5.81 19.30 13.90 19.30	15.70 40.70 2200.00 92.30	1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1 10-1
TAB CV-1 AND CV-2 ANNUAL XQ2VALUES FOR CONTINUOU SD IN ATTACHMENT E, TABLE (1E-	INDIVIDUAL RECEPTORS	MEAT ANIMAL	6.27 6.42 1.20	1.91 6.92 2.74 6.50	5.57 6.31 12.30 17.70	13.00 40.70 15.40	
CV-1 A VALUE: ATTAC	NL RECI	MILK GOAT	5.360 2.040 0.265 0.124	1.910 3.010 0.994 0.372	 1.740 9.050		
X/Q ³ TED IN	IVIDUA	MILK COW	1 1 200	0.807  0.994 1.030	3.090 3.700  5.720	9.540 30.100 	
TABLE 2.2-4 CV-1 AND CV-2 ANNUAL AVERAGE, GROUND LEVEL, X/Q·VALUES FOR CONTINUOUS RELEASES, SPECIAL DISTANCES (IDENTIFIED IN ATTACHMENT E, TABLE 2.2-3), AND SELECTED CONTROL LOCATIONS (IE-7 sec/m ³ )	<b>UN</b>	VEGE- TABLE GARDEN	12.80 6.92 47.40 12.50	6.16 6.92 6.70 6.68	3.40 6.31 13.90 19.30	15.70 40.70 194.00 63.00	
		SITE BOUND- ARY	125.0 50.2 102.0 85.8	54.5 31.1 27.8 24.1	27.5 23.8 22.3 163.0	278.0 487.0 924.0 302.0	•
· .		DOWN- WIND SECTOR	N NNE NE ENE	E ESE SSE SSE	s SSW WSW	MNW WNW	· · · · ·

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J	Beav	ver Vall	ey Powe	r Station	· · · · · · · · · · · · · · · · · · ·	Procedure Num	ber: /2-ODC-2.02
Title: ODCM: GAS	EOUS	S EFFLUE	NTS	· · · · · · · · · · · · · · · · · · ·		Unit: 1/2 Revision:	Level Of Use: In-Field Reference Page Number:
		·····	<u> </u>	TTACHMEN	TF	2	81 of 130
				Page 2 of 7 SPERSION P		S	
	ES	4.5- 5.0	2.470 1.630 1.270 1.080	0.774 0.531 0.666 0.531	0.885 1.070 1.900 3.300	6.040 13.600 18.800 6.310	
	N MIL	4.0-	2.900 1.920 1.500 1.290	0.883 0.630 0.790 0.688	1.050 1.260 2.230 3.880	7.060 15.900 21.900 7.360	
	TION, I	3.5- 4.0	3.810 2.320 1.980 1.930	1.070 0.842 0.960 0.833	1.260 1.670 2.960 5.020	8.440 23.400 32.300 9.460	
TIONS	LOCA	3.0- 3.5	4.69 2.87 2.47 2.41	1.34 1.05 1.20 1.04	1.57 2.07 3.66 6.19	10.40 28.70 39.50 11.60	
ES	NTROL	2.5- 3.0	6.52 3.69 3.73 3.14	1.90 1.49 1.84 1.48	2.23 2.66 4.71 8.49	13.20 36.40 50.10 15.80	
EL, ștanci NTROL	DISTANCES TO THE CONTROL LOCATION, IN MILES	2.0-	8.75 4.99 5.09 4.31	2.61 2.05 2.53 2.02	3.04 3.60 6.38 11.40	17.70 48.50 66.60 21.00	•
KD LEV (AL DIS ED CO	S TO T	1.5-	13.70 7.31 7.51 6.01	3,86 3.29 3.75 3.53	4.48 5.28 11.40 16.60	36.50 73.00 32.20	
GROUN , SPECI ELECT	TANCE	1.0-	22.70 12.20 12.70 10.20	6.57 5.59 6.37 5.98	7.56 8.87 18.40 27.70	60.30 120.00 52.80	
BLE 2.2-5 L AVERAGE, GROUND LEVEL, JS RELEASES, SPECIAL DISTA 2.2-3), AND SELECTED CONTH -7 sec/m ³ )	DIS	0.5- 1.0	49.9 32.0 24.8 20.6	17.7 11.9 13.5 13.7	20.3 23.6 34.8 61.3	132.0 269.0 350.0 114.0	
TABLE 2.2-5 UAL AVERA UOUS RELEA 3LE 2.2-3), Al		0 <del>.</del> 0.5	276.0 189.0 156.0 135.0	116.0 76.7 86.2 87.0	127.0 140.0 204.0 347.0	715.0 1410.0 1820.0 601.0	
2 ANNU ONTINU E, TABI		RESI- DENCE	15.90 7.95 60.20 50.40	38.80 7.64 7.27 10.10	6.38 22.90 15.70 22.40	18.00 48.60 121.00 121.00	
TABLE 2.2-5 VV-1 AND VV-2 ANNUAL AVERAGE, GROUND LEVEL, X/Q VALUES FOR CONTINUOUS RELEASES, SPECIAL DISTANCES (IDENTIFIED IN ATTACHMENT E, TABLE 2.2-3), AND SELECTED CONTROL LOCATIONS (IE-7 sec/m ³ )	PTORS	MEAT ANIMAL I	7.06 7.08 1.24 	1.99 7.64 2.88 7.19	6.10 7.08 13.80 20.40	14.70 48.60 18.10 1	
VV-1. VALUE VATUE	INDIVIDUAL RECEPTORS	MILK GOAT A	5.980 2.150 0.269 1.270	1.990 3.200 1.030 0.382			
X/Q FIED IN	VIDUA	MILK		0.828 1 - 3 1.030 1 1.080 0	3.300 - 4.040 1 - 5.230 -	10.600 - 35.000 1 1	
(IDENTI	INDI	VEGE- TABLE GARDEN	15.00 7.66 57.90 13.60	6.66 7.64 7.27 7.41	3.65 7.08 15.70 22.40	18.00 48.60 262.00 83.40	· ·
		SITE BOUND- ARY (	152.0 62.3 132.0 110.0	67.8 38.0 33.3 29.1	32.8 28.7 26.2 201.0	345.0 598.0 1030.0 345.0	
	I	DOWN- WIND SECTOR	N NNE NE ENE	E ESE SSE SSE	s SW WSW	MNW WNW	

E	Beav	ver Vall	ey Powe	r Station		Procedure Num	ber: /2-ODC-2.02
Title:					· · · · · · · · · · · · · · · · · · ·	Unit: 1/2	Level Of Use: In-Field Reference
ODCM: GASE	EOUS	S EFFLUEN	NTS			Revision: 2	Page Number: 82 of 130
		(		TTACHMEN Page 3 of 7 SPERSION P		S	······································
	ES	4.5- 5.0	0.846 1.100 1.570 1.100	1.200 0.737 0.686 0.546	0.655 0.684 0.977 0.781	0.795 0.731 0.683	66C.U
	DISTANCES TO THE CONTROL LOCATION, IN MILES	4.0- 4.5	0.996 1.290 1.880 1.710	1.280 0.830 0.811 0.646	0.774 0.807 1.150 0.920	0.851 0.791 0.804	co/.u
	A TION,	3.5 <b>-</b> 4.0	1.200 1.430 2.090 2.030	1.730 1.160 1.180 0.937	1.110 0.834 1.060 1.210	1.120 0.686 0.903	0.044
ATIONS	IL LOC	3.0- 3.5	1.480 1.770 2.880 2.620	2.190 1.360 1.460 1.170	1.380 1.030 1.201 1.460	0.741 1.110 1.210	0001
LLOC/	DNTRO	2.5-	1.91 2.69 3.68 3.22	2.83 2.20 2.05 1.89	2.47 1.56 1.57 1.64	1.84 1.84 1.69	х Т
ALUES	THE CO	2.0-2.5	2.56 3.27 5.38 4.75	3.67 3.00 2.79 2.58	3.37 2.11 1.77 2.36	2.50	CC-1
, X/Q V ISTANC TED CC	DES TO	1.5-2.0	5.32 5.47 7.10 6.02	6,20 4.78 4.45 4.06	4.98 3.11 3.12 3.53	3.68 3.07 3.66	2. yo cimize.
LEVEL DIAL D SELEC	STANC	1.0-	8.2700 6.9800 .2300 7.2800	7.8600 8.1400 7.5700 6.9300	8.4900 4.0300 4.9300 4.9000	6.2300 0.0809 0.1170	/Qs may
E 2.2-6 LEVATED LSS, SPE( SES, SPE( 2-3), AND 2-3), AND sec/m ³		0.5-	23.1000 14.5000 0.1160 0.3310	17.1000 12.7000 7.4000 9.4400	8.5100 9.1000 15.9000 17.8000	8.7200 0.0549 0.0650	elease X
TABLE 2.2-6 GE, ELEVATF RELEASES, SI BLE 2.2-3), AN (IE-7 sec/m ³ )		0-0.5	0.0289 0.0175 0.0069 0.0135	0.0124 0.0208 0.4770 0.3030	0.7960 26.1000 36.1000 0.3870	0.0147 0.0202 0.0084	uction devel r
TABLE 2.2-6 PV-1/2 ANNUAL AVERAGE, ELEVATED LEVEL, X/Q VALUES FOR CONTINUOUS RELEASES, SPECIAL DISTANCES IN ATTACHMENT E, TABLE 2.2-3), AND SELECTED CONTROI (1E-7 sec/m ³ )		RESI- DENCE	6.790 6.890 0.055 0.525	8.300 11.200 7.890 9.770	6.310 5.820 3.900 4.350	2.490 2.530 0.073 6.500	ere grou
UNUAL J CONTIN	PTORS	MEAT ANIMAL	2.27 6.14 1.61	2.87 11.60 3.05 7.20	6.06 3.61 3.47 3.98	2.02 2.53 1.67	ation wh
/-1/2 AN FOR ( ATTAC	INDIVIDUAL RECEPTORS		1.910 1.430 0.350 1.770	2.870 4.570 1.230 0.357		 0.163 0.305	Idary loc
PV FIED IN	VIDUA	MILK MILK COW GOAT	- - 1.610	1.240  1.230 1.160	3.490 2.140  1.420	0.764 1.780	ite boun
TABLE 2.2-6 PV-1/2 ANNUAL AVERAGE, ELEVATED LEVEL, X/Q VALUES FOR CONTINUOUS RELEASES, SPECIAL DISTANCES (IDENTIFIED IN ATTACHMENT E, TABLE 2.2-3), AND SELECTED CONTROL LOCATIONS (IE-7 sec/m ³ )	IQNI	VEGE- TABLE GARDEN	6.720 6.690 .074 9.090	8.300 11.600 7.390	3.760 3.610 3.900 4.350	2.490 2.530 0.074 6.460	at
		SITE BOUND- ARY	0.0082 0.0280 0.0110 0.0110	0.0360 0.0420 0.0750 0.2060	5.740 7.640 6.500 0.126	0.029 0.033 0.007 0.008	release X
	1	DOWN- WIND SECTOR	N NNE NE ENE	E ESE SSE	s SSW WSW WSW	MNW MNN	Elevated

E	Beave	er Vall	ey Powe	r Station		Procedure Num 1	/2-ODC-2.02
itle:		· · · · ·				Unit: 1/2	Level Of Use: In-Field Reference
DCM: GASI	EOUS	EFFLUEN	ITS			Revision: 2	Page Number: 83 of 130
		(		TTACHMEN Page 4 of 7 SPERSION P.		•	
	SE	4.5-	2.380 1.590 1.250 1.070	0.735 0.524 0.658 0.572	0.866 1.040 1.850 3.200	5.790 12.900 17.700	5.980
·	IN MILL	4.0- 4.5	2.770 1.870 1.480 1.270	0.871 0.621 0.779 0.676	1.020 1.230 2.170 3.750		6.950
	,TION,	3.5- 4.0	3.640 2.250 1.950 1.900	1.060 0.829 0.945 0.818	1.230 1.620 2.870 4.830	8.040 22.000 30.100	8.880
VTIONS	DISTANCES TO THE CONTROL LOCATION, IN MILES	3.0- 3.5	4.45 2.78 2.42 2.38	1.32 1.03 1.18 1.02	1.53 2.00 3.54 5.93	9.82 26.70 36.60	10.80
L LOCA	NTRO	2.5- 3.0	6.15 3.56 3.64 3.09	1.87 1.46 1.81 1.45	2.17 2.57 4.54 8.09	12.40 33.60 45.90	14.60
LUES JES NTROI	THE CC	2.0-	8.18 4.79 4.95 4.23	2.55 2.00 2.47 1.97	2.94 3.46 6.10 10.80	16.50 44.20 60.30	19.20
X/Q VA ISTANC TED CC	ES TO	1.5- 2.0	12.70 6.94 7.24 5.85	3.75 3.19 3.41	4.29 5.03 10.40 15.60	33.50 65.40 88.80	28.90
EVEL, J CIAL DI SELEC	STANC	1.0- 1.5	20.50 11.40 12.10 9.89	6.32 5.36 6.12 5.71	7.13 8.31 17.20 25.30	53.90 104.00 140.00	45.90
JE 2.2-7 RROUND L ASES, SPE( 2-3), AND sec/m ³	DI	0.5- 1.0	42.6 28.8 23.0 19.4	16.6 11.1 12.6 12.7	18.6 21.3 31.2 53.6	111.0 218.0 279.0	924.0
TABLE ( GE, GRC RELEASI BLE 2.2-3 BLE 2.2-3 (IE-7 sec		0- 0.5	244.0 161.0 132.0 115.0	99.2 65.8 73.5 74.2	109.0 120.0 174.0 301.0	636.0 1310.0 1720.0	557.0
AVERA UOUS R 'E, TAB		RESI- DENCE	14.80 7.64 53.80 46.30	35.70 7.25 7.06 9.69	6.27 20.90 14.80 20.80	16.90 44.50 222.00	99.40
TABLE 2.2-7 TV-2 ANNUAL AVERAGE, GROUND LEVEL, X/Q VALUES FOR CONTINUOUS RELEASES, SPECIAL DISTANCES (IDENTIFIED IN ATTACHMENT E, TABLE 2.2-3), AND SELECTED CONTROL LOCATIONS (IE-7 sec/m ³ )	PTORS	MEAT	6.74 6.83 1.23	1.98 7.25 2.85 6.96	6.00 6.73 13.10 19.10		17.00
TV-2 A FOR I ATTA	L RECE	MILK GOAT	5.740 2.130 0.268 1.280	1.980 3.100 1.020 0.384	 1.800 9.550	 1.870 9.100	1.820
FIED IN	INDIVIDUAL RECEPTORS	MILK COW	1.230	.829  1.020 1.070	3.310 3.890 	10.100 32.500 	. <b>1</b>
(IDENTI	IQNI	VEGE- TABLE GARDEN	14.00 7.37 51.90 13.20	6.49 7.25 7.16 7.16	3.64 6.73 14.80 20.80		71.00
		SITE BOUND- ARY (	105.0 102.0 96.6 84.1	60.7 37.1 41.8 34.0	32.7 29.7 24.1 159.0	264.0 404.0 735.0	247.0
	I	DOWN- WIND B SECTOR	N NNE NE ENE	E ESE SSE SSE	s SSW WSW		MNN

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## ATTACHMENT F Page 5 of 7 0-5 MILE DISPERSION PARAMETERS

## TABLE 2.2-8

## DV-2 ANNUAL AVERAGE, GROUND LEVEL, X/Q VALUES FOR CONTINUOUS RELEASES, SPECIAL DISTANCES (IDENTIFIED IN ATTACHMENT E, TABLE 2.2-3), AND SELECTED CONTROL LOCATIONS (1E-7 sec/m³)

Same as Table 2.2-4

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0-5 MILE DISPERSION PARAMI	ETERS	
TABLE 2.2-9		
WV-2 ANNUAL AVERAGE, GROUND LEV	EL X/O VAL	UES
FOR CONTINUOUS RELEASES, SPECIA		
(IDENTIFIED IN ATTACHMENT E, TABLE 2.2-3), AND SE		
$(12E-7 \text{ sec/m}^3)$		INOL LOCATIONS
(IE-7 sec/m)		
Same as Table 2.2-4		

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Beaver	Valley	Power	Station
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Procedure N	imber:
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## ATTACHMENT F Page 7 of 7 0-5 MILE DISPERSION PARAMETERS

## TABLE 2.2-10

## CB-2 ANNUAL AVERAGE, GROUND LEVEL, X/Q VALUES FOR CONTINUOUS RELEASES, SPECIAL DISTANCES (IDENTIFIED IN ATTACHMENT E, TABLE 2.2-3), AND SELECTED CONTROL LOCATIONS

Same as Table 2.2-7

DOSE FACTORS K _i TOTAL BODY DOSE FACTOR mrem/yr Per uCi/m ³	ATTACHMENT C Page 1 of 2 E FACTORS AND D TABLE 2.2-11 FOR NOBLE GASES L _i SKIN DOSE FACTOR mrem/yr Per uCi/m ³	DOSE PARAMETER S AND DAUGHTER Mi GAMMA AIR DOSE FACTOR mrad/yr	RS Ni BETA AIR DOSI FACTOR
NOBLE GAS DOS DOSE FACTORS K _i TOTAL BODY DOSE FACTOR mrem/yr Per uCi/m ³	Page 1 of 2 E FACTORS AND E TABLE 2.2-11 FOR NOBLE GASES L _i SKIN DOSE FACTOR mrem/yr Per	Revision: 2 3 OOSE PARAMETER S AND DAUGHTER M _i GAMMA AIR DOSE FACTOR mrad/yr	Page Number: 87 of 130 S S Ni BETA AIR DOSI FACTOR
NOBLE GAS DOS DOSE FACTORS K _i TOTAL BODY DOSE FACTOR mrem/yr Per uCi/m ³	Page 1 of 2 E FACTORS AND E TABLE 2.2-11 FOR NOBLE GASES L _i SKIN DOSE FACTOR mrem/yr Per	2 JOSE PARAMETER S AND DAUGHTER M _i GAMMA AIR DOSE FACTOR mrad/yr	87 of 130 S S Ni BETA AIR DOSI FACTOR
DOSE FACTORS K _i TOTAL BODY DOSE FACTOR mrem/yr Per uCi/m ³	Page 1 of 2 E FACTORS AND E TABLE 2.2-11 FOR NOBLE GASES L _i SKIN DOSE FACTOR mrem/yr Per	DOSE PARAMETER S AND DAUGHTER Mi GAMMA AIR DOSE FACTOR mrad/yr	S RS Ni BETA AIR DOSI FACTOR
DOSE FACTORS K _i TOTAL BODY DOSE FACTOR mrem/yr Per uCi/m ³	E FACTORS AND E TABLE 2.2-11 FOR NOBLE GASES L _i SKIN DOSE FACTOR mrem/yr Per	S AND DAUGHTER M _i GAMMA AIR DOSE FACTOR mrad/yr	RS Ni BETA AIR DOSI FACTOR
DOSE FACTORS K _i TOTAL BODY DOSE FACTOR mrem/yr Per uCi/m ³	TABLE 2.2-11 FOR NOBLE GASES L _i SKIN DOSE FACTOR mrem/yr Per	S AND DAUGHTER M _i GAMMA AIR DOSE FACTOR mrad/yr	RS Ni BETA AIR DOS FACTOR
DOSE FACTORS K _i TOTAL BODY DOSE FACTOR mrem/yr Per uCi/m ³	FOR NOBLE GASES L _i SKIN DOSE FACTOR mrem/yr Per	M _i GAMMA AIR DOSE FACTOR mrad/yr	N _i BETA AIR DOS FACTOR
DOSE FACTORS K _i TOTAL BODY DOSE FACTOR mrem/yr Per uCi/m ³	FOR NOBLE GASES L _i SKIN DOSE FACTOR mrem/yr Per	M _i GAMMA AIR DOSE FACTOR mrad/yr	N _i BETA AIR DOS FACTOR
DOSE FACTORS K _i TOTAL BODY DOSE FACTOR mrem/yr Per uCi/m ³	FOR NOBLE GASES L _i SKIN DOSE FACTOR mrem/yr Per	M _i GAMMA AIR DOSE FACTOR mrad/yr	N _i BETA AIR DOS FACTOR
K _i TOTAL BODY DOSE FACTOR mrem/yr Per uCi/m ³	L _i SKIN DOSE FACTOR mrem/yr Per	M _i GAMMA AIR DOSE FACTOR mrad/yr	N _i BETA AIR DOS FACTOR
K _i TOTAL BODY DOSE FACTOR mrem/yr Per uCi/m ³	L _i SKIN DOSE FACTOR mrem/yr Per	M _i GAMMA AIR DOSE FACTOR mrad/yr	N _i BETA AIR DOS FACTOR
DE ⁽¹⁾ TOTAL BODY DOSE FACTOR mrem/yr Per uCi/m ³	SKIN DOSE FACTOR mrem/yr Per	GAMMA AIR DOSE FACTOR mrad/yr	BETA AIR DOS FACTOR
DOSE FACTOR mrem/yr Per uCi/m ³	FACTOR mrem/yr Per	DOSE FACTOR mrad/yr	FACTOR
mrem/yr Per uCi/m ³	mrem/yr Per	mrad/yr	
Per uCi/m ³	Per	-	
Per uCi/m ³	Per	-	mrad/yr
uCi/m ³		Per	Per
·····	uCI/III	uCi/m ³	uCi/m ³
m 756E 00		1.93E+01	2.88E+02
n 7.56E-02 n 1.17E+03	1.46E+03	1.93E+01 1.23E+03	2.88E+02 1.97E+03
1.61E+01	1.34E+03	1.72E+03	1.97E+03
			1.03E+04
			2.93E+03
			1.06E+04
			7.83E+03
			1.11E+03
			1.48E+03
			1.05E+03
			7.39E+02
			2.46E+03
			1.27E+04
			4.75E+03
	2.69E+03	9.30E+03	3.28E+03
	1.47E+04 1.66E+04	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1.47E+042.37E+031.52E+041.66E+041.01E+041.73E+041.56E+047.29E+031.63E+041m9.15E+014.76E+021.56E+023m2.51E+029.94E+023.27E+0232.94E+023.06E+023.53E+025m3.12E+037.11E+023.36E+0351.81E+031.86E+031.92E+0371.42E+031.22E+041.51E+0388.83E+034.13E+039.21E+03

Rea	ver Valley Pow	ver Station	1	Procedure Nu	
	ver valley 10v				1/2-ODC-2.02
'itle			1	Unit:	Level Of Use: In-Field Reference
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		ATTACHMENT G	<b></b>	•	
	·	Page 2 of 2			
	NOBLE GAS DOSE	•	OSE PARA	METER	S
		· · ·	····		•
		TABLE 2.2-12			
					- · · ·
	DOSE PARAMETE	ERS FOR FINITE EL	EVATED	PLUME	S
	$V_i^{(1)}$	Bi ^{(1), (2)}	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	(3)	B _i ⁽³⁾
	•	1			
	TOTAL BODY	GAMMA AIR	TOTAL		GAMMA AIR
NUCLIDE ⁽⁴⁾	DOSE FACTOR	DOSE FACTOR	DOSE F	ACTOR	DOSE FACTOR
•	mrem/yr	mrad/yr	mrei	n/vr	mrad/yr
	Per	Per		er	Per
	uCi/sec	uCi/sec	uCi		uCi/sec
	· · · · · · · · · · · · · · · · · · ·		·····		
Kr-83m	3.19E-10	1.75E-8		3E-8	3.96E-5
Kr-85m	7.81E-5	1.16E-4		)E-4	7.06E-4
Kr-85	1.55E-6	2.35E-6		4E-6	8.40E-6
Kr-87	5.13E-4	7.74E-4		5E-3	2.19E-3
Kr-88	1.39E-3	2.09E-3		9E-3	6.16E-3
Kr-89	7.99E-4	1.20E-3		5E-3	1.88E-3
Xe-131m	1.64E-5	2.47E-5		7E-4	3.09E-4
Xe-133m	1.38E-5	2.11E-5	1.32	2E-4	2.61E-4
Xe-133	1.05E-5	1.56E-4	1.54	4E-4	2.76E-4
Xe-135m	2.41E-4	3.66E-4	6.21	lE-4	9.50E-4
Xe-135	1.41E-4	2.12E-4	6.96	6E-4	1.05E-3
Xe-137	6.00E-5	9.05E-5	9.66	6E-5	1.46E-4
Xe-138	8.11E-4	1.22E-3	2.22	2E-3	3.34E-3
Ar-41	1.02E-3	1.53E-3	2.68	3E-3	4.02E-3
			:		

⁽¹⁾ V_i and B_i values used to implement Modes 1, 2, and 3 of Section 2.2.1 (10CFR20)

⁽²⁾ B_i values used to implement Modes 1, 2, 3, and 4 of Section 2.3.1 (10CFR50)

⁽³⁾ V_i and B_i values to implement Mode 4 of Section 2.2.1 (10CFR20) and to implement monitor setpoint determinations of Section 2.1.2 and 2.1.4

⁽⁴⁾ The listed dose parameters are for radionuclides that may be detected in gaseous effluents.

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ATTACHMENT H Page 1 of 1 ORGAN DOSE PARAMETERS			
		L	
Table 2.2-13		н Хала Х	
P VALUES FOR A CHILD FOR THE BEAVER VALLEY SITE			

(mrem/yr per uCi/cu meter)

. •	Muclide	Bone	Liver	T. Body	Thyroid	Lidney	Lung	gi-lli
1	8-3	0.00 <b>8</b> +00	1.128+03	1.128+03	1.12 <b>5+0</b> 3	1.128+03	1.128+03	1.128+03
2	- 2-32	2.60E+06	1.148+05	9.888+04	0.00 <b>E+0</b> 0	0.00E+00	0.00 <b>E+00</b>	4.228+04
3	Cr-51	0.00E+00	0.00 <b>1</b> +00	1.54E+02	8.551+01	2.43 <b>8+</b> 01	1.708+04	1.08 <b>E</b> +03
	Ma-54	0.008+00	4.298+04	9.515+03	0.008+00	1.008+04	1.582+06	2.29 <b>8+04</b>
5	Je-59	2.07 <b>8+04</b>	3.348+04	1.878+04	0.005+00	0.008+00	1.278+08	7.078+04
. 8	Co-57	0.00 <b>E</b> +00	9.035+02	1.078+03	0.00 <b>E</b> +00	0.001+00	5.078+05	1.328+04
1	Co-58	0.00 <b>E+</b> 00	1.77 <b>8</b> +03	3.18 <b>E</b> +03	0.002+00	0.001+00	1.118+06	3. <b>448</b> +04
	Co-60	0.002+00	1.318+04	2.268+04	0.005+00	0.00 <b>2+</b> 00	7.078+06	9.62 <b>8</b> +04
· 9	Za-65	4.258+04	1.138+05	7.038+04	0.00 <b>2</b> +00	7.145+04	9.95 <b>8+</b> 05	1.638+04
10	Bb-86	0.00 <b>E</b> +00	1.985+05	1.141+05	0.00 <b>E+0</b> 0	0.002+00	0.00 <b>8</b> +00	7.998+03
	Sr-89	5.99 <b>8</b> +05	0.098+00	1.728+04	0.00 <b>E</b> +00	0.002+00	2.16 <b>1</b> +06	1.67E+05
	Sr-90	1.018+08	0.00 <b>1+0</b> 0	6. <b>448</b> +06	0.002+00	0.00 <b>E</b> +00	1. <b>488+0</b> 7	3.438+05
	Y-91	9.148+05	0.008+00	2.448+04	0.00 <b>E+</b> 00	0.00 <b>E+00</b>	2.63 <b>1</b> +06	1.842+05
	Zr-95	1.908+05	4.188+04	3.70 <b>8</b> +04	0.00 <b>1</b> +00	5.968+04	2.23 <b>8</b> +06	6.11 <b>E+04</b>
15	ND-95	2.35 <b>8+04</b>	9.18 <b>E+0</b> 3	6.558+03	0.00 <b>E</b> +00	8.628+03	6.148+05	3.708+04
	¥Ъ-97	4.29 <b>8</b> -01	7.70 <b>8</b> -02	3.608-02	0.00 <b>E</b> +00	8.55 <b>8</b> -02	3.42 <b>E+</b> 03	2.78E+04
	Ko-99	0.005+00	1.728+02	4.26 <b>8</b> +01	0.00 <b>E</b> +00	3.928+02	1.358+05	1.27 <b>8</b> +05
	1c-99a	1.781-03	3. <b>488-</b> 03	5. <b>778-02</b>	0.00 <b>E</b> +00	5.078-02	9.51 <b>8+02</b>	4.81 <b>8+03</b>
	Ru-103	2.79 <b>E+0</b> 3	0.001+00	1.07E+03	0.00 <b>E</b> +00	7.031+03	6.628+05	4.488+04
20	Ru-106	1.368+05	0.00 <b>8</b> +00	1.698+04	0.002+00	1.848+05	1.438+07	4.298+05
	Ag-110m	1.69 <b>E+</b> 04	1.148+04	9.14 <b>8</b> +03	0.00 <b>E</b> +00	2.128+04	5.48 <b>8</b> +08	1.008+05
	Sb-124	5.748+04	7.40 <b>8</b> +02	2.00 <b>8</b> +04	1.26E+02	0.00 <b>E+</b> 00	3.248+06	1.648+05
	Sb-125	9.848+04	7.59 <b>8</b> +02	2.07 <b>X+</b> 04	9.10 <b>E</b> +01	0.00E+00	2.321+06	4.03E+04
	Te-127n	2.49 <b>8</b> +04	8.55 <b>8</b> +03	3.02 <b>8</b> +03	6.07E+03	6.36E+04	1.488+06	7.148+04
25	Te-1292	1.928+04	6.852+03	3.04 <b>8</b> +03	6.33 <b>8</b> +03	5.038+04	1.765+06	1.828+05
	1-131	4.81 <b>8</b> +04	4.818+04	2.738+04	1.628+07	7.881+04	0.008+00	2.848+03
	I-133	1.66E+04	2.03 <b>8</b> +04	7.708+03	3.858+06	3.38 <b>E</b> +04	0.00 <b>E+</b> 00	5. <b>488+0</b> 3
	Cs-134	6.51 <b>8+0</b> 5	1.018+06	2.25E+05	0.008+00	3.30 <b>8+0</b> 5	1.21 <b>8+0</b> 5	3.85 <b>1</b> +03
29	Ca-136	6.51 <b>8+04</b>	1.718+05	1.162+05	0.00 <b>8</b> +00	9.558+04	1.458+04	4.188+03
30	Cs-137	9.078+05	8.258+05	1.288+05	0.00 <b>1</b> +00	2.828+05	1.048+05	3.828+03
31	Ba-140	7.40 <b>8+0</b> 4	6.48 <b>1</b> +01	4.338+03	0.00 <b>E</b> +00	2.118+01	1.745+08	1.028+05
32	La-140	6.44E+02	2.25 <b>1</b> +02	7.558+01	0.008+00	0.008+00	1.831+05	2.26 <b>E+</b> 05
	Ce-141	3.928+04	1.958+04	2.90 <b>5</b> +03	0,00 <b>E</b> +00	8.558+03	5.448+05	5.66 <b>8+04</b>
34	Ce-144	6.77 <b>2</b> +06	2.12 <b>8+06</b>	3.818+05	0.008+00	1.178+06	1.201+07	3.89 <b>8+0</b> 5

Calculated per ODCM equation 2.2-13

Beaver Va	alley Power S	tation	Procedure Numb	^{per:} 2-ODC-2.02
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	Pa	ACHMENT I age 1 of 1 ASEOUS RELEA		
	ТА	BLE 2.3-1		
	EOUS RELEASE FI PLEMENTATION C			ENTS FOR
RELEASE POINT	RELEASE MODE 1	RELEASE MODE 2	RELEASE MODE 3	RELEASE MODE 4
RP 1; VV-1, Auxiliary Building Vent ⁽¹⁾	Aux. Bldg. Ventilation	Containment Purge ⁽³⁾	Same As Mode	Same As Mode 1
RP 2; CV-1, Rx Containment/SLCRS Vent ⁽¹⁾	Leakage Collection Exhaust	Same As Mode 1	Same As Mode and Containmen Purge ⁽³⁾	
RP 3; PV-1/2, Gaseous Waste/Process Vent ⁽²⁾	Main Cond. Air Ejector, Waste Gas, Containment Vacuum	Same As Mode 1	Same As Mode	Same As Mode 1 and Containment Purge
RP 4; VV-2 SLCRS Unfiltered Pathway ⁽¹⁾	Contiguous Areas	Containment Purge ⁽³⁾	Same As Mode	Same As Mode 1
RP 5; CV-2, SLCRS Filtered Pathway ⁽¹⁾	Aux. Bldg. Ventilation	Same As Mode 1	Same As Mode 1 and Containment Purge ⁽³⁾	
RP 6; CB-2, Condensate Polishing Bldg Vent ⁽¹⁾	(4)	(4)	( <b>4</b> )	(4)
RP 7; WV-2, Waste Gas Storage Vault Vent ⁽¹⁾	<b>(4)</b>	(4)	(4)	(4)
RP 8; DV-2, Decontamination Bldg Vent ⁽¹⁾	(4)	(4)	(4)	(4)
RP 9; TV-2, Turbine Bldg Vent ⁽¹⁾	(4)	(4)		(4)
		· ·	· ·	

NOTE: For the purpose of implementing 10 CFR 50, batch discharges may use continuous meteorology since short term meteorology is used at the time of the annual report.

⁽¹⁾ Continuous ground level meteorology is applicable

⁽²⁾ Continuous elevated meteorology is applicable

⁽³⁾ Mode established by purge from one unit, all other release points remain same as Mode 1

.

⁽⁴⁾ Not normally a radioactive release point

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## Table 2.3-2

## R VALUES FOR BRAVER VALLET SITE

(arem/yr per uCi/cu meter)

## Pathway = Inhalation Age Group = Adult

	Age Group	= Adult	·	a je		14.1		
	Suclide	Bone	Liver	T. Body	Thyroid	Lidney	Lung	GI-LLI
1	B-3	0.00E+00	1.262+03	1.261+03	1.26E+03	1.261+03	1.288+03	1.262+03
2	P-32	1.32E+06	7.711+04	5.01 <b>E+04</b>	0.00E+00	0.001+00	0.00E+00	8.64 <b>8</b> +04
3	Cr-51	0.00E+00	0.00E+00	1.002+02	5.95E+01	2.281+01	1.448+04	3.328+03
-4	Mn-54	0.00E+00	3.982+04	6.30E+03	0.00E+00	9.84 <b>X</b> +03	1.408+08	7.748+04
5	Je-59	1.185+04	2.78E+04	1.063+04	0.00E+00	0.005+00	1.028+06	1.865+05
6	Co-57	0.00 <b>E</b> +00	6.92 <b>E+</b> 02	6.71 <b>8+02</b>	0.008+00	0.008+00	3.70 <b>2+0</b> 5	3.148+04
1	Co-58	0.00 <b>5</b> +00	1.58 <b>E+</b> 03	2.07E+03	0.008+00	0.008+00	9.28 <b>E+</b> 05	1.062+05
8	Co-60	0.008+00	1.158+04	1.488+04	0.001+00	0.002+00	5.978+06	2.855+05
9	Za-65	3.248+04	1.03E+05	4.662+04	0.008+00	6.90E+04	8.64 <b>5</b> +05	5.348+04
10	Rb-88	0.008+00	1.358+05	5.902+04	0.00E+00	0.008+00	0.00 <b>E+</b> 00	1.662+04
11	Sr-89	3.04 <b>8</b> +05	0.00 <b>8+0</b> 0	8.72 <b>1</b> +03	0.002+00	0.002+00	1.408+06	3.508+05
12	Sr-90	9.92 <b>8+0</b> 7	0.00E+00	6.10 <b>E+0</b> 6	0.001+00	0.008+00	9.60 <b>8</b> +06	7.225+05
13	Y-91	4.628+05	0.00E+00	1.245+04	0.008+00	0.008+00	1.708+06	3.658+05
-14	Zr-95	1.078+05	3.44 <b>8</b> +04	2.338+04	0.001+00	5.428+04	1.778+06	1.508+05
15	<b>86-95</b>	1.418+04	7.82 <b>8</b> +03	4.218+03	0.008+00	7.741+03	5.058+05	1.048+05
	¥b-97	2.22 <b>8-0</b> 1	5.62 <b>8-0</b> 2	2.058-02	0.00E+00	6.54E-02	2.40 <b>E</b> +03	2.42 <b>E+0</b> 2
17	80-99	0.002+00	1.218+02	2.30E+01	0.00 <b>E</b> +00	2.918+02	9.128+04	2. <b>48E+0</b> 5
18	Tc-99m	1.038-03	2.91 <b>8-</b> 03	3.70 <b>8-02</b>	0.00 <b>2+</b> 00	4.42 <b>1-</b> 02	7. <b>64E</b> +02	4.16 <b>E</b> +03
19	Ru-103	1.538+03	0.00 <b>%+0</b> 0	6.588+02	0.00E+00	5.831+03	5.05 <b>E</b> +05	1.108+05
20	Ru-106	8.91E+04	0.002+00	8.728+03	0.00E+00	1.341+05	9.36 <b>8</b> +06	9.128+05
	Ag-110m	1.088+04	1.002+04	5.941+03	0.00E+00	1.978+04	4.83 <b>8</b> +06	3.028+05
	Sb-124	3.12 <b>8+</b> 04	5.898+02	1.248+04	7.558+01	0.001+00	2.48 <b>E+</b> 06	4.06 <b>5</b> +05
	Sb-125	5.348+04	5.958+02	1.268+04	5.408+01	0.00 <b>1</b> +00	1.74 <b>E</b> +06	1.018+05
	Te-127m	1.26 <b>E+</b> 04	5.778+03	1.57 <b>8</b> +03	3.298+03	4.58 <b>E+</b> 04	9.608+05	1.50 <b>E+</b> 05
25	Te-129s	9.76 <b>8</b> +03	4.87 <b>8</b> +03	1.58 <b>E+</b> 03	3.448+03	3.661+04	1.162+06	3:838+05
	I-131	2.528+04	3.581+04	2.058+04	1.198+07	6.138+04	0.008+00	8.288+03
	1-133	8.64 <b>E</b> +03	1.482+04	4.52 <b>E</b> +03	2.15E+08	2.588+04	0.00 <b>1+00</b>	8.881+03
	Cs-134	3.73 <b>8</b> +05	8.48\$+05	7.281+05	0.00 <b>E</b> +00	2.871+05	9.768+04	1.048+04
	Cs-138	3.908+04	1.461+05	1.10 <b>2+0</b> 5	0.00E+00	8.56 <b>8+04</b>	1.208+04	1.17 <b>8</b> +04
30	Cs-137	4.788+05	6.218÷05	4.281+05	0.00 <b>8</b> +00	2.228+05	7.52 <b>5</b> +04	8.40 <b>5</b> +03
	Ba~140	3.90 <b>8</b> +04	4.90E+01	2.578+03	0.008+00	1.678+01	1.271+06	2.188+05
	Ea-140	3. <b>448</b> +02	1.748+02	4.588+01	0.00 <b>2</b> +00	0.008+00	1.361+05	4.588+05
	Ce-141	1.998+04	1.358+04	1.53E+03	0.00 <b>1</b> +00	6.28 <b>5</b> +03	3.62 <b>5</b> +05	1.208+05
34	Ce-144	3.438+06	1.438+06	1.848+05	0.008+00	8.488+05	7.76 <b>E</b> +06	8.16 <b>E+0</b> 5

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Calculated per ODCM equation 2.3-22

# Beaver Valley Power Station

Title:

1/2-ODC-2.02				
Unit: 1/2	Level Of Use: In-Field Reference			
Revision:	Page Number:			
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## ODCM: GASEOUS EFFLUENTS

## ATTACHMENT J Page 2 of 19 P&I ORGAN DOSE FACTORS

#### Table 2.3-3

#### R VALUES FOR BEAVER VALLEY SITE

(area/yr per sCi/cu meter)

### Pathway = Inhalation Age Group = Teen

	Nuclide	Bone	Liver	T. Body	Thyroid	Lidney	Lung	GI-LLI
1	H-3	0.00 <b>E+00</b>	1.27E+03	1.278+03	1.278+03	1.278+03	1.278+03	1.278+03
	P-32	1.898+06	1.108+05	7.168+04	0.00E+00	0.008+00	0.00E+00	9.288+04
-	Cr-51	0.00E+00	0.00E+00	1.35E+02	7.50E+01	3.071+01	2.10E+04	3.00E+03
	Mn-54	0.00E+00	5.118+04	8.402+03	0.00E+00	1.278+04	1.98E+06	6.68X+04
	Fe-59	1.598+04	3.70E+04	1.43E+04	0.00E+00	0.002+00	1.538+08	1.781+05
8	Co-57	0.008+00	9.441+02	9.20 <b>8+0</b> 2	0.00 <b>2</b> +00	0.008+00	5.88E+05	3.14 <b>8</b> +04
- 7	Co-58	0.00E+00	2.075+03	2.788+03	0.008+00	0.002+00	1.341+06	9.521+04
8	Co-60	0.002+00	1.51 <b>8+</b> 04	1.98E+04	0.001+00	0.00 <b>E+</b> 00	8.728+06	2.59E+05
9	Za-65	3.868+04	1.34 <b>E+</b> 05	6.248+04	0.00 <b>1</b> +00	8.648+04	1.248+08	4.668+04
10	Rb-86	0.001+00	1.905+05	8.408+04	0.00E+00	0.005+00	0.00 <b>8</b> +00	1.77E+04
	Sr-89	4.341+05	0.008+00	1.258+04	0.00 <b>2+0</b> 0	0.005+00	2.428+06	3.71 <b>8</b> +05
12	Sr-90	1.088+08	0.00 <b>6+0</b> 0	6.688+06	0.00E+00	0.00 <b>E+00</b>	1.658+07	7.65 <b>8+0</b> 5
	Y-91	8.61 <b>1+</b> 05	0.00 <b>5+0</b> 0	1.77 <b>8</b> +04	0.002+00	0.008+00	2.948+06	4.09 <b>E</b> +05
-14	2r-95	1.488+05	4.58 <b>E</b> +04	3.15 <b>E+04</b>	0.008+00	6.74 <b>8</b> +04	2.698+06	1.498+05
15	Nb-95	1.862+04	1.03 <b>E</b> +04	5.668+03	0.008+00	1.008+04	7.51 <b>8</b> +05	9.68 <b>E</b> +04
	Nb-97	3.14E-01	7.788-02	2.848-02	0.00 <b>8+0</b> 0	9.12 <b>B</b> -02	3.93E+03	2.17E+03
	Mo-99	0.00 <b>E</b> +00	1.69E+02	3.221+01	0.008+00	4.11 <b>E</b> +02	1.548+05	2.692+05
18	Tc-99a	1.388-03	3.86E-03	4.998-02	0.00 <b>2</b> +00	5.76 <b>E</b> -02	1.158+03.	6.13 <b>E+0</b> 3
19	Ru-103	2.10E+03	0.005+00	8.96 <b>E</b> +02	0.00E+00	7.438+03	7.838+05	1.092+05
20	Ru-106	9.848+04	0.00 <b>1</b> +00	1.248+04	0.008+00	1.908+05	1.818+07	9.60 <b>8</b> +05
	Ag-110m	1.388+04	1.318+04	7.991+03	0.008+00	2.508+04	6.75E+06	2.731+05
	Sb-124	4.308+04	7.948+02	1.685+04	9.768+01	0.001+00	3.34E+06	3.98 <b>5</b> +05
	Sb-125	7.388+04	8.081+02	1.728+04	7.04E+01	0.00E+00	2.148+06	9.928+04
	Te-127m	1.808+04		2.181+03	4.388+03	6.548+04	1.868+06	1.59 <b>1+</b> 05
.25	Te-1298	1.398+04	6.58 <b>X</b> +03	2.258+03	4.58E+03	5.198+04	1.981+06	4.058+05
	1-131	3.548+04	4.91 <b>R</b> +04	2.648+04	1.468+07	8.408+04	0.008+00	6.49 <b>8</b> +03
	I-1 <b>3</b> 3	1.228+04	2.058+04	6.22 <b>8</b> +03	2. <b>928+06</b>	3.598+04	0.00E+00	1.038+04
	Ca-134		1.138+06	5.498+05	0.008+00	3.758+05	1.468+05	9.76 <b>5</b> +03
	Cs-136	5.158+04	.1.94 <b>E</b> +05	1.378+05	0.00 <b>8+0</b> 0	1.108+05	1.76 <b>8+</b> 04	1.09 <b>8+</b> 04
- 30	Cs-137	6.70 <b>E</b> +05	8.48 <b>X</b> +05	3.11 <b>5+0</b> 5	0.00 <b>E+00</b>	3.04 <b>8</b> +05	1.218+05	8.488+03
	Ba-140	5.478+04	6.70B+01	3.528+03	0.00E+00	2.288+01	2.03E+08	2.298+05
		4.79 <b>E</b> +02	2.368+02	6.268+01	0.00 <b>8+</b> 00	0.008+00	2.14 <b>E+05</b>	4.871+05
	Ce-141	2.848+04	1.902+04	2.178+03	0.008+00	8.888+03	6.14E+05	1.262+05
34	Ce-144	4.898+06	2.02 <b>8</b> +06	2.628+05	0.00 <b>E+</b> 00	1.218+06	1.34B+07	8.648+05

Calculated per ODCH equation 2.3-22

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Beaver Valley Power Station	Procedure Number: 1/2-ODC-2.02			
Title:	Unit: 1/2	Level Of Use: In-Field Reference		
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## Table 2.3-4

## R VALUES FOR BEAVER VALLEY SITE

(arem/yr per uCi/cu meter)

			6		11. L			
	Pathway : Age Group	= Inbalation > = Child						· .
	Nuclide	Bone	Liver	T. Body	Thyroid	Lidney	Lung	GI-LLI
-	H-3	0.00 <b>E</b> +00	1.128+03	1.122+03	1.128+03	1.128+03	1.128+03	1.12 <b>5</b> +03
	P-32	2.60 <b>5</b> +06	1.148+05	9.88 <b>8+04</b>	0.00 <b>E+0</b> 0	0.001+00	0.00 <b>B+00</b>	4.228+04
	Cr-51	0.008+00	0.008+00	1.548+02	8.55 <b>8</b> +01	2.43 <b>8+</b> 01	1.70 <b>8+04</b>	1.08 <b>E+</b> 03
	Ka-54"	0.001+00	4.298+04	9.51 <b>E</b> +03	0.001+00	1.00 <b>E+</b> 04	1.588+06	2.29 <b>E+</b> 04
5	Fe-59	2.078+04	3.348+04	1.678+04	0.002+00	0.00 <b>2+0</b> 0	1.27 <b>E+06</b>	7.07 <b>8</b> +04
8	Co-57	0.00E+00	9.038+02	1.071+03	0.00 <b>X+0</b> 0	0.00 <b>E+0</b> 0	5.07 <b>E+05</b>	1.328+04
. 7	Co-58	0.00E+00	1.771+03	3,16 <b>8+</b> 03	0.00 <b>5+0</b> 0	0.00 <b>1+</b> 00	1.11 <b>B+06</b>	3.448+04
	Co-60	0.002+00	1.318+04	2.26 <b>E+</b> 04	0.002+00	0.008+00	7.07 <b>8+06</b>	9.628+04
9	Za-65	4.25E+04	1.138+05.	7.03E+04	0.00 <b>8+00</b>	7.14 <b>X+0</b> 4	9.958+05	1.63E+04
10	Rb-86	0.008+00	1.988+05	1.14 <b>E+</b> 05	0.00E+00		0.00E+00	7.99 <b>E</b> +03
11	Sr-89	5.99E+05	0.002+00	1.728+04	0.002+00	0.001+00	2.165+06	1.678+05
	Sr-90	1.018+08	0.008+00	8.44E+06	0.00E+00	0.008+00	1.488+07	3.43E+05
	Y-91		0.00E+00	2.448+04	0.005+00	0.008+00	2.638+06	1.848+05
	Zr-95	1.908+05	4.188+04	3.708+04	0.00E+00	5.961+04	2.23E+06	6.11E+04
	Nb-95	2.35E+04	9.188+03	6.55E+03	0.00E+00	6.621+03	8.14E+05	3.70E+04
16	ND-97	4.29B-01	7.708-02	3.60E-02	0.008+00	8.558-02	3.428+03	2.78 <b>E</b> +04
17	No-99		1.728+02	4.268+01	0.005+00	3.928+02	1.358+05	1.278+05
18	Tc-99m	1.788-03	3.488-03	5.778-02	0.005+00	5.071-02	9.51 <b>8+02</b>	4.812+03
19	Ru-103	2.79E+03	0.002+00	1.078+03	0.005+00	7.031+03	6.828+05	4.488+04
20	Ru-106	1.368+05	0.00E+00	1.698+04	0.00E+00	1.848+05	1.43 <b>E+0</b> 7	4.298+05
:12 - 1 <b>6</b> 4				1200	A AOD AA	0 101 04	C 108.00	
	Ag-110a	1.698+04	1.148+04	9.148+03	0.008+00	2.128+04	5.488+06	1.008+05
	Sb-124	5.748+04 9.848+04	7.401+02	2.00 <b>5+04</b> 2.07 <b>5+04</b>	1.265+02	0.00E+00 0.00E+00	3.248+06	1.64E+05 4.03E+04
	Sb-125 Te-127m	9.848+04 2.498+04	7.59 <b>1</b> +02 8.55 <b>1</b> +03	2.0/8+04 3.028+03	9.108+01 8.078+03	0.008+00 6.368+04	2.328+08 1.488+06	
	Te-127	1.928+04		3.048+03	8.33E+03	5.03E+04	1.768+06	7.14E+04 1.82E+05
	16-172	1.348704	0.038703	3.041103	0.338703	3.03104	1.108700	1.028703
	I-131	4.818+04		2.73 <b>8+04</b>	1.628+07	7.882+04	0.00 <b>E+0</b> 0	2.848+03
	I-133	1.668+04	2.03E+04	7.702+03	3.85 <b>E+</b> 06	3.381+04	0.00 <b>8+00</b>	5.488+03
	Ce-134	6.51E+05-	1.011+06	2.258+05	0.008+00	3.301+05		3.858+03
	Cs-136	6.518+04	1.718+05	1.168+05	0.00 <b>0+00</b>	9.558+04	1.458+04	4.18 <b>E</b> +03
30	Cs-137	9.07E+05	8.258+05	1.288+05	0.008+00	2.821+05	1.048+05	3. <b>628</b> +03
	Ba-140	7.408+04	8.48 <b>8</b> +01	4.33 <b>8</b> +03	0.008+00	2.11 <b>E</b> +01	1.748+06	1.028+05
	La-140	6.448+02	2.258+02	7.558+01	0.00E+00	0.005+00	1.838+05	2.265+05
	Ce-141	3.928+04	1.958+04	2.90 <b>E+</b> 03	0.00 <b>E+0</b> 0	8.558+03	5.448+05	5.661+04
- 34	Co-144	6.778+05	2.12 <b>1</b> +06	3.618+05	0.008+00	1.178+08	1.208+07	3.89 <b>1</b> +05

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Calculated per ODCH equation 2.3-22

# Beaver Valley Power Station

Pathway = Inhalation

FIOCEDUIE INL	1/2-ODC-2.02	
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## ODCM: GASEOUS EFFLUENTS

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#### Table 2.3-5

#### R VALUES FOR BRAVER VALLEY SITE

## (ures/yr per uCi/cu meter)

		. THURIGATOR					18 5 5	
	Age Group	) = Infant	۰.					
	Nuclide	Bone	Liver	1. Body	Thyroid	Lidney	Lung	GI-LLI
1	8-3	0.002+00	6.478+02	6.478+02	6.47 <b>E+0</b> 2	8.478+02	6.478+02	6.47E+02
- 2	P-32	2.03 <b>E+</b> 06	1.12 <b>E+0</b> 5	.7.74E+04	0.008+00	0.00E+00	0.005+00	1.618+04
3	Cr-51	0.00 <b>E+0</b> 0	0.00 <b>E+</b> 00	8.958+01	5.75 <b>E+01</b>	1.328+01	1.288+04	3.57E+02
. (	Mn-54	0.00 <b>8+0</b> 0	2.538+04	4.988+03	0.00E+00	4.98E+03	1.001+06	7.081+03
5	Fe-59	1.362+04	2.358+04	9.48 <b>8+</b> 03	0.00 <b>2+0</b> 0	0.002+00	1.018+06	2.48 <b>8</b> +04
ŧ	Co-57	0.00E+00	6.51E+02	6.41 <b>B</b> +02	0.00E+00	0.00 <b>8</b> +00	3.798+05	4.86E+03
	Co-58	0.00 <b>1</b> +00	1.228+03	1.828+03	0.00 <b>E+0</b> 0	0.00 <b>E+0</b> 0	7.77 <b>8+0</b> 5	1.11 <b>E+04</b>
	Co-60		8.02 <b>E</b> +03	1.188+04	0.008+00	0.002+00	4.518+06	3.198+04
-	Za-65	1.93 <b>E+04</b>	6.26E+04	3.11 <b>E+04</b>	0.008+00	3.25 <b>E+04</b>	8.478+05	5.14B+04
10	Rb-86	0.00 <b>2+0</b> 0	1.90 <b>8</b> +05	8.828+04	0.008+00	0.001+00	0.00 <b>E+0</b> 0	3.04E+03
	Sr-69	3.988+05	0.008+00	1.148+04	0.00 <b>2+0</b> 0	0.00E+00	2.03E+06	8.40B+04
12	Sr-90	4.09E+07	0.001+00	2.59B+06	0.00E+00	0.001+00	1.128+07	1.31 <b>8+0</b> 5
	Y-91	5.88 <b>%+0</b> 5	0.008+00	1.578+04	0.00 <b>E+0</b> 0	0.00 <b>1</b> +00	2.45E+06	7.03E+04
	Zr-95	1.151+05	2.79 <b>E</b> +04	2.03E+04	0.00 <b>E+00</b>	3.111+04	1.75E+06	
15	#b-95	1.578+04	6.438+03	3.78 <b>E</b> +03	0.00 <b>E</b> +00	4.728+03	4.798+05	1.278+04
16	Nb-97	3.42 <b>E-</b> 01	7.29 <b>8</b> -02	2.63 <b>2</b> -02	0.00E+00	5.70 <b>8-0</b> 2	3.328+03	2.698+04
-	No-99	0.008+00	1.65 <b>1</b> +02	3.23E+01	0.008+00	2.658+02		4.87E+04
18	Tc-99m	1.40B-03	2.888-03	3.72 <b>8-</b> 02	0.00E+00	3.118-02	8.11E+02	2.031+03
	Ru-103	2.02E+03	0.00 <b>6</b> +00	6.79E+02	0.002+00	4.248+03	5.52E+05	1.61 <b>8</b> +04
20	Ru-106	8.68E+04	0.00 <b>E</b> +00	1.09 <b>8</b> +04	0.008+00	1.07 <b>E+0</b> 5	1.168+07	1.648+05
21	Ag-110m	9.98E+03	7.228+03	5.00E+03	0.00 <b>8+0</b> 0	1.098+04	3.67 <b>2+</b> 08	3.30E+04
22	Sb-124	3.798+04	5.568+02	1.208+04	1.018+02	0.00E+00	2.651+08	5.918+04
-23	Sb-125	5.17E+04	4.77E+02	1.09E+04	6.23E+01	0.00E+00		1.478+04
	Te-127m	1.67 <b>E+</b> 04	6.90X+03	2.071+03	4.87E+03	3.758+04	1.318+06	2.73 <b>E+</b> 04
25	Te-129	1.418+04	6.09E+03	2.238+03	4.218+03	3.188+04	1.688+06	8.908+04
26	I-131	3.79E+04	4.44B+04	1.968+04	1.48E+07	5.188+04	0.008+00	1.068+03
- 27	I-133	1.328+04	1.928+04	5.60E+03	3.568+06	2.248+04	0.00E+00	2.16R+03
28	Cs-134	3.96E+05	7.03 <b>E+0</b> 5	7.45 <b>8+0</b> 4	0.00E+00	1.908+05	7.97E+04	1.338+03
29	Cs-138	4.838+04	1.35E+05	5.298+04	0.00E+00	5.648+04	1.188+04	1.43E+03
	Ce-137	5.498+05	6.12E+05		0.008+00	1.728+05	7.138+04	1.338+03
31	Ba-140	5.60E+04	5.60 <b>8+</b> 01	2.90 <b>8+</b> 03	0.00 <b>E+0</b> 0	1.348+01	1.60E+06	3.84E+04
32	La-140	5.058+02	2.008+02	5.158+01	0.00E+00	0.008+00	1.681+05	
	Ce-141	2.778+04	1.67E+04	1.99E+03	0.00E+00	5.258+03	5.17 <b>1+</b> 05	2.16E+04
34	Ce-144	3.19E+06	1.218+06	1.768+05	0.00E+00	5.388+05	9.848+06	1.488+05

Calculated per ODCM equation 2.3-22

Title:

Beaver Valley Power Station	Procedure N	umber: 1/2-ODC-2.02
Title:	Unit: 1/2	Level Of Use: In-Field Reference
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## Table 2.3-8

## R VALUES FOR BEAVER VALLEY SITE

## (sq meter-mrem/yr per uCi/sec)

Pathway = Ground

	Nuclide	Bone	Liver	T. Body	Thyroid	Lidney	Lung	GI-LLI
1	H-3,	0.00 <b>E+0</b> 0	0.008+00	0.008+00	0.00 <b>E</b> +00	0.00 <b>8+0</b> 0	0.00 <b>2+00</b>	0.00E+00
	P-32	0.00 <b>8</b> +00	0.008+00	0.002+00	0.00 <b>1</b> +00	0.002+00	0.002+00	0.005+00
3	Cr-51	4.662+06	4.668+06	4.661+06	4.661+06	4.66E+06	4.661+06	4.66E+06
. 4	Hn-54	1.39E+09	1.398+09	1.391+09	1.395+09	1.398+09	1.391+09	1.398+09
5	Fe-59	2.735+08	2.738+08	2.731+08	2.73 <b>5</b> +08	2.73 <b>E</b> +08	2.73 <b>E+0</b> 8	2.738+08
6	Co-57	0.00E+00	0.00 <b>2</b> +00	0.008+00	0.00E+00	0.00 <b>1+0</b> 0	0.008+00	0.00 <b>8+0</b> 0
. 7	Co-58	3.79 <b>5+</b> 08	3.79 <b>E</b> +08	3.79 <b>8</b> +08	3.79 <b>E</b> +08	3.798+08	3.79 <b>8</b> +08	3.79 <b>8+0</b> 8
- 8	Co-60 .	2.151+10	2.15 <b>E</b> +10	2.15E+10	2.15E+10	2.15 <b>2</b> +10	2.15 <b>8</b> +10	2.15 <b>8</b> +10
9	2 <b>a-65</b>	7.47 <b>8</b> +08	. 7.47 <b>8</b> +08	7. <b>478+</b> 08	7.478+08	7.47 <b>6</b> +08	7. <b>478+0</b> 8	7.47B+08
10	Rb-86	8.99 <b>8</b> +06	8.995+06	6.995+06	8.998+06	8.99 <b>8</b> +06	8.99 <b>8</b> +06	8.998+06
- 11	Sr-89	2.16 <b>E+</b> 04	2.168+04	2.168+04	2.168+04	2.16E+04	2.16E+04	2.18E+04
- 12	Sr-90	0.00 <b>8+</b> 00	0.002+00	0.00E+00	0.00E+00	0.00 <b>E+</b> 00	0.00 <b>8+0</b> 0	0.00E+00
- 13	Y-91	1.078+06	1.071+06	1.07 <b>E+0</b> 6	1.078+06	1.078+06	1.078+06	1.075+08
14	Zr-95	2.45E+08	2.458+08	2.458+08	2.458+08	2.45 <b>1+</b> 08	2.45 <b>8+</b> 08	2.45 <b>1+</b> 08
15	Nb-95	1.375+08	1.37 <b>5</b> +08	1.378+08	1.378+08	1.378+08	1.378+08	1.378+08
	Nb-97	0.002+00	0.008+00	0.002+00	0.00 <b>E+</b> 00	0.00 <b>E+0</b> 0	0.00 <b>2+00</b>	0.00 <b>E+00</b>
	No-99	4.00 <b>E</b> +06	4.002+06	4.00E+06	4.002+06	4.00E+06	4.008+08	4.008+06
	Tc-99a	1.845+05	1.848+05	1.848+05	1.848+05	1.84E+05	1.84E+05	1.848+05
	Ru-103	1.08 <b>5</b> +08	- 1.08 <b>E+</b> 08	1.082+08		1.088+08	1.08 <b>R+0</b> 8	1.068+08
20	Ru-106	4.228+08	4.228+08	4.22 <b>1</b> +08	4.228+08	4.228+08	4.22 <b>2+08</b>	4.228+08
	Ag-110m	3.44 <b>8</b> +09	3.44E+09	3.44E+09		3.4 <b>42</b> +09	3.44E+09	3,448+09
	Sb-124	0.00 <b>2</b> +00	0,008+00	0.00E+00	0.00E+00	0.008+00	0.008+00	0.002+00
	Sb-125	0.005+00	0.008+00	0.008+00	0.002+00	0.002+00	0.00 <b>R+</b> 00	0,00 <b>E</b> +00
	Te-127m	9.171+04	9.178+04	9.17E+04		9.17 <b>5</b> +04	9.17E+04	9.17 <b>5</b> +04
25	Te-129#	1.988+07	1.988+07	1.988+07	1.981+07	1.988+07	1.988+07	1.988+07
26	I-131	1.72E+07	1.728+07	1.728+07	1.728+07	1.728+07	1.728+07	1.728+07
27	1-133	2.458+06	2.45E+06	2.458+06	2.45E+06	2.458+06	2.45 <b>2+</b> 06	2.458+06
26	Cs-134	6.868+09	6.86E+09	6.861+09	6.868+09	6.86E+09	6.868+09	6.868+09
29	Ca-136	1.518+08	1.51E+08	1.518+08	1.518+08	1.51E+08	1.518+08	1.51E+08
	Ca-137	1.03 <b>E</b> +10	1.038+10	1.038+10	1.038+10	1.03 <b>E</b> +10	1.03 <b>E</b> +10	1.038+10
31	Ba-140	2.058+07	2.05E+07	2.051+07	2.058+07	2.05E+07	2.058+07	2.058+07
32	La-140	1.928+07	1.928+07	1.928+07	1.928+07	1.928+07	1.928+07	1.921+07
33	Ce-141	1.378+07	1.37E+07	1.378+07	1.378+07	1.37E+07	1.37E+07	1.378+07
34	Ce-144	6.962+07	6.96 <b>E</b> +07	6.968+07	6.96 <b>8</b> +07	6.96 <b>2</b> +07	6.96 <b>E+</b> 07	6.962+07

Calculated per ODCM equation 2.3-23

# Beaver Valley Power Station

Procedure	Number:	
. *	1/2-ODC-2.02	
Linit [,]	Level Of Lise	

## ODCM: GASEOUS EFFLUENTS

Title:

Unit:	Level Of Use:
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#### Table 2.3-7

#### R VALUES FOR BRAVER VALLEY SITE

#### (sq meter-mrem/yr per uCi/sec)

#### Pathway = Vegetation Age Group = Adult

	Nuclide	Bone	Liver	T. Body	Thyroid	Kidney	Long	GI-LLI
1	H-3	0.008+00	2.28 <b>8</b> +03	2.26 <b>8+0</b> 3	2.26E+03	2.262+03	2.26 <b>2+</b> 03	2.26 <b>E+0</b> 3
2	₽-32	1.40E+09	8.74X+07	5.43 <b>X+</b> 07	0.008+00	0.002+00	0.00E+00	1.588+08
3	Cr-51	0.00X+00	0.008+00	4.848+04	2.788+04	1.028+04	6.16E+04	1.178+07
4	Mn-54	0.002+00	3.13E+08	5.978+07	0.00E+00	8.311+07	0.008+00	9.598+08
5	Ye-59	1.261+08	2.96 <b>E</b> +08	1.148+08	0.002+00	0.00 <b>1</b> +00	8.281+07	9.888+08
6	Co-57	0.008+00	1.17 <b>8</b> +07	1.95E+07	0.00E+00	0.00 <b>1</b> +00	0.00E+00	2.97E+08
	Co-58	0.00E+00	3.07 <b>8</b> +07	6.891+07	0.00E+00	0.00 <b>5</b> +00	0.008+00	6.23 <b>8+08</b>
	Co-60	0.00 <b>2+00</b>	1.878+08	3.69E+08	0.001+00	0.00 <b>E+0</b> 0	0.00 <b>E</b> +00	3.148+09
	Zn-65	3.17 <b>8+08</b>	1.01 <b>E</b> +09	4.56E+08	0.008+00	6.75 <b>5+</b> 08	0.00 <b>E+</b> 00	6.362+08
10	Rb-86	0.00 <b>E+0</b> 0	2.19 <b>E</b> +08	1.028+08	0.001+00	0.00 <b>8+</b> 00`	0.008+00	4.33 <b>E</b> +07
	Sr-89	9.978+09	0.00 <b>E+0</b> 0	2.86E+08	0.008+00	0.00 <b>2+0</b> 0	0.008+00	1.608+09
	Sr-90	6.058+11	0.00 <b>E+0</b> 0	1.488+11	0.00E+00	0.00 <b>E</b> +00	0.00E+00	1.758+10
-	Y-91	5.11 <b>E+06</b>		1.378+05	0.00E+00	0.008+00	0.001+00	2.818+09
	Zr-95	1.178+06	3.77 <b>8+</b> 05	2.55E+05	0.00 <b>E</b> +00	5.918+05	0.001+00	1.198+09
15	Nb-95	1.428+05	7.928+04	4.26E+04	0.008+00	7.83 <b>X+04</b>	0.001+00	4.818+08
	¥b-97	2.168-06	5.46 <b>8-</b> 07	1.99K-07	0.008+00	6.37 <b>2-</b> 07	0.008+00	2.028-03
	Bo-99	0.008+00	6.15 <b>E+</b> 06	1.178+06	0.00 <b>x+0</b> 0	1.398+07	0.00 <b>8+00</b> .	1:43 <b>E+0</b> 7
	Tć-99a	3.10 <b>B+</b> 00	8.77 <b>E+</b> 00	1.128+02	0.00 <b>E+0</b> 0	1.33E+02		5.198+03
	Bu-103	<b>4.778+0</b> 8	0.00 <b>E+</b> 00	2.06 <b>8+06</b>	0.00 <b>E+</b> 00	1.828+07	0.00 <b>1+00</b>	
20	Ru-108	1.938+08	0.002+00	2.448+07	0.008+00	3.72 <b>E+0</b> 8	0.00 <b>E</b> +00	1.258+10
	Ag-110m	1.058+07	9.75 <b>8</b> +08	5.798+08	0.00E+00	1.928+07	0.001+00	3.98 <b>8</b> +09
	Sb-124	1.048+08	1.962+06	4.118+07		0.001+00	8.078+07	2,948+09
	Sb-125	1.378+08	1.53E+06	3.25 <b>8+</b> 07	1.398+05	0.008+00	1.058+08	1.50E+09
	Te-127m	3. <b>498+08</b> ·	1.251+08	4.268+07		1.428+09	0.008+00	1.178+09
25	Te-1298	2.518+08	9.388+07	3.98 <b>2</b> +07	8.648+07	1.058+09	0.002+00	1.278+09
	I-131	8.088+07	1.168+08	6.62E+07	3.79 <b>E</b> +10	1.98E+08	0.008+00	3.058+07
	I-133	2.098+06	3.63 <b>8</b> +06	1.11 <b>E+06</b>	5.33 <b>E+08</b>	6.33 <b>I</b> +06	0.00E+00	3.26E+08
	Cs-134	4.67 <b>8</b> +09	1.118+10	9.088+09	0.00E+00		1.19 <b>E+09</b>	1.948+08
	Cs-136	4.278+07	1.695+08	1.211+08	0.00 <b>E+</b> 00	9.388+07	1.298+07	1.918+07
30	Cs-137	8.36E+09	8.708+09	5.70 <b>1</b> +09	0.008+00	2.958+09	9.81 <b>8+0</b> 8	1.682+08
	Ba-140	1.298+08	1.618+05	8.422+06	0.008+00	5.498+04	9.248+04	2.651+08
	La-140	1.98 <b>E</b> +03	9.97 <b>8</b> +02	2.638+02	0.00 <b>E+0</b> 0	0.008+00	0.00 <b>E+</b> 00	7.32 <b>8+07</b>
	Ce-141	1.978+05	1.33 <b>E+0</b> 5	1.518+04	0.00 <b>E+0</b> 0	6.19 <b>8+</b> 04	0.008+00	5.108+08
34	Ce-144	3.29B+07	1.388+07	1.778+06	0.008+00	8.168+05	0.001+00	1.118+10

All nuclides (except H-3) calculated per ODCH equation 2.3-26 · H-3 calculated per ODCH equation 2.3-29

Beaver Valley Power Station	Procedure N	umber: 1/2-ODC-2.02
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#### Table 2.3-8

#### E VALUES FOR BEAVER VALLEY SITE

#### (sq meter-mrem/yr per aCi/sec)

### Pathway = Vegetation Age Group = Teen

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	Nuclide	Bone	Liver	T. Body	Thyroid	Lidney	Lung	GI-LLI	
	1 8-3	0.008+00	2.59 <b>8+0</b> 3	2.598+03	2.59 <b>8+</b> 03	2.598+03	2.59E+03	2.59 <b>2+</b> 03	
	2 P-32	1.61E+09	9.981+07	6.24B+07	0.00E+00	0.001+00	0.00B+00	1.35E+08	
	3 Cr-51	0.00E+00	0.005+00	6.178+04	3.438+04	1.358+04	8.818+04	1.04E+07	
÷.,	4 8n-54 👘	0.002+00	4.541+08	9.018+07	0.002+00	- 1.36 <b>1+</b> 08	0.008+00 :	9.328+08	
	5 Fe-59	1.798+08	4.19 <b>2+</b> 08	1.62E+08	0.008+00	0.008+00	1.328+08	9.90 <b>5</b> +08	
	8 Co-57	0.008+00	1.79 <b>8</b> +07	3.00 <b>8</b> +07	-0.00 <b>2</b> +00	0.008+00	0.008+00	3.33 <b>8+</b> 08	
	7 Co-58	0.008+00	4.36 <b>E</b> +07	1.00E+08	0.0 <b>01</b> +00	0.00 <b>8</b> +09	0.008+00	6.01 <b>2</b> +08	
	8 Co-60	0.00 <b>8+0</b> 0	· 2.49 <b>6</b> +08	5.608+08	0.00 <b>E+</b> 00	0.00 <b>E+0</b> 0	0.00E+00	3.248+09	
	9 Za-65	4.24 <b>E</b> +08	1. <b>478+</b> 09	6.87 <b>8</b> +08	0.00 <b>8+</b> 00	9. <b>425+08</b>	9.00 <b>1+</b> 00	6.23 <b>E+</b> 08	
1	0 Rb-86	0.00 <b>6</b> +00	2.748+08	1.292+08	0.00 <b>E</b> +00	0.00E+00	0.00E+00	4.058+07	
	1 Sr-89	1.518+10	0.00 <b>E+0</b> 0	4.34 <b>8</b> +08	0.008+00	0.00 <b>8+</b> 00	0.00E+00	1.80E+09	
	2 Sr-90	7.518+11	0.002+00	1.855+11	0.00E+00	0.00 <b>E+</b> 00	0.008+00	2.11 <b>E</b> +10	
	3 7-91	7.848+06	0.00 <b>1</b> +00	2.101+05	0.008+00	0.001+00	0.00E+00	3.21E+09	
	4 Zr-95	1.728+06	5.431+05	3.74E+05	0.00E+00	7.981+05	0.008+00	1.251+09	
1	5 Xb-95	1.922+05	1.078+05	5.878+04	0.00 <b>8</b> +00	1.031+05	0.008+00	4.568+08	
	6 Nb-97	2.00E-06	4.97 <b>5</b> -07	1.818-07	0.008+00	5.818-07	0.00E+00	1.198-02	
	7 No-99	0.00E+00	5.658+06	1.088+06	0.00 <b>E+00</b>	1.29 <b>E+</b> 07	0.00E+00	1.018+07	
	8 Tc-99m	2.74E+00	7.64E+00	9.905+01	0.00E+00		4.248+00	5.028+03	
	9 Ru-103	6.82 <b>8+06</b>	0.008+00	2.92 <b>X</b> +06	0.00 <b>E</b> +00		0.002+00	5,708+08	
~ 2	0 Ru-106	2.388+08	0.001+00	3.908+07	0.00 <b>E</b> +00	5.978+08	0.008+00	1.482+10	
	1 Ag-110m	1.528+07	1.438+07	8.725+06	0.008+00	2.748+07	0.00E+00	4.03E+09	
_	2 56-124	1.548+08	2.848+06	8.02 <b>8+</b> 07	3.50 <b>8</b> +05	0.00E+00	1.358+08	3.11 <b>E</b> +09	
	3 Sb-125	2.148+08	2.34 <b>E+0</b> 6	5.018+07	2.058+05	0.005+00	1.888+08	1.67E+09	
	4 Te-127a	5.528+08	1.968+08	6.56 <b>8+</b> 07	1.315+08	2.24E+09	0.008+00	1.378+09	
2	5 7e-129m	3.628+08	1.348+08	5.738+07	1.17 <b>5</b> +08	. 1.518+09	0.008+00	1.368+09	
2	6 I-131	7.698+07	1.08E+08	5.788+07	3.14E+10	1.858+08	0.008+00	2.138+07	
. 2	7 1-133	1.948+06	3.29E+06	1.008+06	4.598+08	5.77 <b>E</b> +06	0.00E+00	2.49B+06	
2	8 Cs-134	7.108+09	1.678+10	7.75E+09	0.00E+00	5.31 <b>8+0</b> 9	2.03E+09	2.088+08	
2	9 Cs-136	4.388+07	1.72E+08	1.168+08	0.002+00	9.37E+07	1.48E+07	1.398+07	
	0 Cs-137	1.018+10	1.358+10	4.698+09	0.00 <b>E</b> +00	4.598+09	1.788+09	1.925+08	
	1 Ba-140	1.388+08		8.90 <b>8+</b> 06	0.00 <b>E</b> +00	5.748+04	1.14 <b>8</b> +05	2.138+08	
	2 La-140	1.818+03	8.88 <b>8</b> +02	2.361+02	0.00 <b>E</b> +00	0.00 <b>2+00</b>	0.00 <b>8</b> +00	5.10 <b>E</b> +07	
	3 Ce-141	2.83E+05	1.898+05	2.178+04	0.00E+00	8.90 <b>8+</b> 04	0.00 <b>0+</b> 00	5.41E+08	
. 3	4 Cej-144 -	5.278+07	2.18E+07	2.838+06	0.00 <b>E+</b> 00	1.308+07	0.00E+00	1.338+10	

All nuclides (except H-3) calculated per ODCH equation 2.3-26 H-3 calculated per ODCH equation 2.3-29

Title:

### ODCM: GASEOUS EFFLUENTS

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#### Table 2.3-9

#### R VALUES FOR BEAVER VALLEY SITE

#### (sq meter-mrem/yr per uCi/sec)

	Pathway = Age Group	Vegetation = Child					s é tip transp	
	Huclide	Bone	Liver	T. Body	Thyroid	Lidney	Lung	GI-LLI
. 1	<b>H-</b> 3	0.008+00	4.01 <b>E+03</b>	4.018+03	4.01E+03	4.01E+03	4.01 <b>E</b> +03	4.01 <b>8+03</b>
2	P-32	3.37E+09	1.58E+08	1.308+08		0.00E+00	0.00E+00	9.32E+07
3	Cr-51	0.008+00	0.00E+00	1.178+05	6.508+04	1.788+04	1.19R+05	6.21E+06
4	Kn-54	0.00 <b>2</b> +00	8.658+08	1.778+08	0.00E+00	1.861+08	0.008+00	5.588+08
5	Fe-59	3.981+08	8.43 <b>E</b> +08	3.208+08	0.00E+00	0.00 <b>8+</b> 00	1.878+08	6.70 <b>2</b> +08
-	Co-59	0.002+00	2.99 <b>2+</b> 07	6.04 <b>2+07</b> ,		0.00 <b>8+0</b> 0	0.001+00	
	°Co-58	0.00 <b>8+0</b> 0,	6.44 <b>2</b> +07	1.978+08	0.00 <b>E</b> +00	0.00 <b>E+0</b> 0	0.001+00	3.762+08
-	Co-60	0.00 <b>2+0</b> 0	3.78 <b>1</b> +08	1.125+09	0.00 <b>E</b> +00	0.00 <b>E+0</b> 0	0.00E+00	
	Zn-65	8.138+08	2.17 <b>1+</b> 09	1.358+09	0.00 <b>E+0</b> 0	1.36E+09	0.00 <b>E+00</b>	3.808+08
10	Rb-86	0.005+00	4.52 <b>8</b> +08	2.788+08	0.00E+00	0.00E+00	0.00 <b>E+00</b>	2.91E+07
.11	Sr-89	3.60E+10	0:00E+00	1.032+09	0.008+00	0.002+00	0.008+00	1.391+09
	Sr-90	1.24E+12	0.008+00	3.15E+11	0.00E+00	0.002+00	0.008+00	
	Y-91	1.868+07	0.001+00	4.998+05	0.008+00	0.008+00	0.00E+00	2.488+09
	2r-95	3.86E+06	8.48E+05	7.55E+05	0.00E+00	1.21E+06	0.008+00	8.851+08
15	Nb-95	4.11E+05	1.601+05	1.148+05	0.002+00	1.50E+05	0.00E+00	2.96E+08
16	ND-97	3.65 <b>8-06</b>	6.59B-07	3.08 <b>8-0</b> 7	0.00E+00	7.31 <b>B-0</b> 7	0.00 <b>8+</b> 00	2.03E-01
17	No-99	0.00E+00	7.718+06	1.918+06	0.002+00	1.65 <b>E+</b> 07	0.00 <b>E+00</b>	6.38E+06
18	Tc-99	4.71 <b>8+</b> 00	9.24 <b>8</b> +00	1.53 <b>E+0</b> 2	0.008+00	1.348+02	4.69E+00	5.268+03
19	Ru-103	1.538+07	0.008+00	5.90 <b>8+06</b>	0.008+00	3.868+07	0.008+00	3.978+08
20	Ru-106	7.458+08	0.008+00	9.308+07	0.008+00	1.018+09	0.00E+00.	1.168+10
	Ag-110m	3.21 <b>8+07</b>	2.17 <b>8+</b> 07		0.008+00	4.04E+07		
	Sb-124	3.528+08		1.238+08		0.00 <b>E+0</b> 0	1.951+08	2.202+09
	Sb-125	4.99 <b>2</b> +08	3.858+06	1.058+08	4.631+05	0.00 <b>E+0</b> 0	2.788+08	1.198+09
	Te-127m	1.321+09	3.562+08	1.57 <b>E+08</b>	3.16E+08	3.77E+09	0.00 <b>8+0</b> 0	
25	Te-129a	8.415+08	2.358+08	1.318+08	2.718+08	2.47 <b>5</b> +0 <del>9</del>	0.00 <b>1+00</b> .º	1.038+09
	I-131	1.438+08	1.448+08	8.17 <b>8+</b> 07	4.768+10	2.36 <b>8+0</b> 8	0.008+00 =	
	1-133	3.53 <b>1</b> +06	4.378+06	1.658+06		7.28E+06	0.008+00	1.768+06
	Cs-134	1.60E+10	2.63E+10	5.55E+09	0.002+00	8.15B+09	2.93E+09	1.428+08
	Cs-136	8.248+07		1.478+08	0.005+00	1.21E+08	1.80E+07	
30	Ca-137	2.39 <b>E</b> +10	2.298+10	3.38 <b>8</b> +09	0.001+00	7.46E+09	2.682+09	1.438+08
	Ba-140	2.778+08	2.428+07	1.628+07	0.008+00	7.89 <b>E+</b> 04	1.458+05-	1.408+08
	La-140	3.258+03	1.138+09	3.838+02	0.00E+00	0.00E+00 -	0.00 <b>8+00</b>	3.18E+07
	Ce-141	6.56E+05	3.27 <b>E+0</b> 5	4.868+05	0.00E+00		0.008+00	4.08E+08
34	Ce-144	1.27 <b>E+08</b>	3.98E+07	6.78 <b>8</b> +06	0.00 <b>1</b> +00	2.218+07	0.00 <b>1</b> +00	1.04 <b>E</b> +10

All auclides (except H-3) calculated per ODCM equation 2.3-26 H-3 calculated per ODCH equation 2.3-29

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#### Table 2.3-10

#### R VALUES FOR BRAVER VALLEY SITE

#### (sq meter-area/yr per uCi/sec)

#### Pathway = Meat Age Group = Adult Nuclide Liver T. Body Thyroid Kidney GI-LLI Bone Lung 1 H-3 0.00E+00 3.258+02 3.258+02 3.25E+02 3.251+02 3.25E+02 3.251+02 4.448+08 2 P-32 1.538+08 0.00E+00 0.001+00 0.008+00 3.95E+09 2.468+08 3.50E+03 1.298+03 3 Cr-51 0.00E+00 0.008+00 5.86E+03 7.788+03 1.475+06 4 Hn-54 0.00B+00 6.498+06 1.248+08 0.008+00 1.938+06 0.00E+00 1.991+07 N. 5 Fe-59 2.14E+08 5.048+08 1.938+08 0.008+00 0.008+00 1.418+08 1.688+09 0.008+00 6.662+06 0.001100.0 6 Co-57 0.008+00 4.011+08 0.00E+00 1.028+08 7 Co-58 0.00E+00 1.421+07 3.18E+07 0.00E+00 0.00E+00 0.008+00 2.878+08 8 Co-60 0 008+00 5.128+07 1.138+08 0.00E+00 0.002+00 0.00E+00 9.618+08 0.00E+00 9 2n-65 2.548+08 8.098+08 3.668+08 5.41E+08 0.008+00 5.108+08 10 Rb-86 0.008+00 4.118+08 1.928+08 0.008+00 0.00E+00 0.00E+00 8.11E+07 2.418+08 6.92E+06 0.00E+00 0.008+00 11 Sr-89 0.001+00 0.00K+00 3.878+07 12 Sr-90 8.418+09 0.00E+00 2.068+09 0.00E+00 0.00E+00 0.00B+00 2.431+08 13 T-91 8.948+05 0.001+00 2.391+04 0.00B+00 0.008+00 0.00E+00 4.928+08 0.00E+00 7.398+05 1.498+09 14 21-95 1.478+08 4.718+05 3.19E+05 0.00R+00 15 Nb-95 1.898+06 1.058+08 5.648+05 0.00E+00 1.048+06 0.00E+00 6.37E+09 16 Wh-97 17 No-99 0.00E+00 8.511+04 1.62E+04 0.008+00 1.932+05 0.00E+00 1.978+05 1.848-19 18 Tc-99 3.838-21 1.081-20 1.388-19 0.008+00 5.308-21 6.40E-18 8.578+07 3.69R+07 0.00R+00. 3.278+08 1.00E+10 19 Ru-103 0.008+00 0.00E+00 20 Ru-106 1.978+09 0.00E+00 2.498+08 0.00E+00 3.80E+09 0.008+00 1.278+11 4.778+06 21 Ag-110m 4.418+06 2.628+06 0.008+00 8 87R+08 0.008+00 1 802+09 22 Sb-124 0.008+00 0.00E+00 0.008+00 0.00E+00 0.008+00 0.00E+00 0.008+00 ų 0.00E+00 0.008+00 0.00E+00 0.00E+00 23 Sb-125 0.001+00 0.008+00 0.008+00 $\gamma_i$ 24 Te-127m 8.38E+08 3.00E+08 1.028+08 2.148+08 3.408+09 0.00E+00 2.81R+09 25 Te-129m 9.338+08 3.488+08 1.488+08 3.218+08 3.891+09 0.00**E+00** 4.708+09 26 T-131 9.13E+06 1.31E+07 7.488+06 4.288+09 2.248+07 0.00E+00 3 458+08 27 1-133 3.128-01 5.428-01 1.658-01 7.96E+01 9.468-01 0.008+00 4.878-01 28 Ca-134 4.538+08 1.088+09 8.818+08 0.008+00 3.498+08 1.168+08 1.895+07 4.598+06 29 Ca-136 1.02E+07 4.048+07 2.918+07 0,008+00 2.258+07 3.08E+06 30 Ca-137 5.908+08 8.068+08 5.288+08 0.00E+00 2.748+08 9.10E+07 1.568+07 3.06E+04 1.608+06 0.00E+00 1.048+04 1.75E+04 5.028+07 31 Ba-140 2.448+07 32 La-140 3.168-02 1.598-02 4.218-03 0.00E+00 0.00E+00 0.005+00 1.178+03 33 Ce-141 1.168+04 7.831+03 8.881+02 0.00E+00 3.64E+03 0.008+00 2.998+07 34 Ce-144 1.035+06 4.328+05 5.558+04 0.00E+00 2.568+05 0.001+00 3.508+08

All nuclides (except H-3) calculated per ODCM equation 2.3-25 H-3 calculated per ODCM equation 2.3-30

Pathway = Meat

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#### Table 2.3-11

#### B VALUES FOR BRAVER VALLEY SITE

#### (sq meter_mrem/yr per uCi/sec)

	Age Group = Teen							
	Nuclide	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
1	H-3	0.00 <b>1</b> +00	1.948+02	1.94E+02	1.948+02	1.94 <b>E+0</b> 2	1.948+02	1.94 <b>E+0</b> 2
2	P-32	3.34 <b>X</b> +09	2.075+08	1.298+08	0.00E+00	0.00E+00	0.00E+00	2.80E+08
3	Cr-51	0.002+00	0.00E+00	4.698+03	2.60E+03	1.038+03	6.69E+03	7.888+05
4	Mn-54	0.008+00	4.958+06	9.818+05	0.008+00	1.488+06	0.00E+00	1.018+07
5	Fe-59	1.718+08	4.00E+08	1.548+08	0.008+00	0.008+00	1.268+08	9.45E+08
6	Co-57	0.008+00	3.228+06	5.40X+06	0.008+00	0.008+00	0.008+00	6.01E+07
1	Co-58	0.008+00	1.09E+07	2.52 <b>8+07</b>	0.008+00	0.00 <b>8</b> +00	0.00E+00	1.518+08
8	Co-60	0.00E+00	3.971+07	8.958+07	0.008+00	0.00 <b>2</b> +00	0.00E+00	5.17E+08
9	Za-65	1.798+08	6.211+08	2.908+08	0.008+00	3.97 <b>5+</b> 08	0.00E+00	2.63K+08
	Rb-86	0.00E+00	3.431+08	1.61E+08	0.008+00	0.00 <b>E</b> +00	0.00 <b>2</b> +00	5.08E+07
11	S <del>r</del> -89	2.03E+08	0.008+00	5.838+06	0.008+00	0.002+00	0.00E+00	2.428+07
12	Sr-90	5.448+09	0.00 <b>1+0</b> 0	1.34E+09	0.008+00	0.00 <b>8</b> +00	0.00E+00	1.53E+0B
13	Y-91	7.53 <b>8+0</b> 5	0.001+00	2.028+04	0.00E+00	0.00E+00	0.00E+00	3.09E+08
14	Zr-95	1.18E+06	3.71 <b>1+0</b> 5	2.558+05	0.00E+00	5.45 <b>8+0</b> 5	0.008+00	8.562+08
15	Nb-95	1.47 <b>8+0</b> 6	8.178+05	4.508+05	0.008+00	7.928+05	0.00E+00	3.49E+09
16	Nb-97	*******	*******	******	0.00 <b>2+0</b> 0	*******	0.00E+00	*******
17	Ho-99	0.008+00	7.038+04	1.34E+04	0.00E+00	1.611+05	0.002+00	1.26E+05
18	Tc-99m	3.04E-21	8.481-21	1.108-19	0.00R+00		4.718-21	5.578-18
19	Ru-103	6.988+07	0.001+00	2.988+07	0.008+00	2.46E+08	0.00E+00	5.83 <b>5+</b> 09
20	Ru-106	1.282+09	0.001+00	2.098+08	0.008+00	3.19 <b>8</b> +09	0.008+00	7.948+10
21	Ag-110m	3.61E+06	3.428+06	2.088+06	0.008+00		0.00E+00	9.60 <b>E</b> +08
22	Sb-124	0.00E+00	0.008+00	0.001+00	0.00E+00	0.00E+00	0.008+00	0.002+00
	Sb-125	0.008+00	0.008+00	0.00E+00	0.008+00		0.00E+00	0.008+00
	Te-127a	7.07E+08	2.518+08	8.41E+07	1.681+08	2.87E+09	0.00E+00	1.76E+09
25	Te-129m	7.828+08	2.90 <b>8+0</b> 8	1.248+08	2,528+08	3.278+09	0.00E+00	2.93E+09
26	I-131	7.59 <b>2</b> +06	1.068+07	5.71 <b>E+</b> 06	3.108+09	1.838+07	0.00 <b>E+</b> 00	2.10E+06
21	I-133	2.61 <b>E-01</b>	4.428-01	1.35E-01	6.178+01	7.75 <b>8-0</b> 1	0.00 <b>2+</b> 00	3.34 <b>8-0</b> 1
28	Cs-134	3.60E+08	8.488+08	3.93E+08	0.00E+00	2.69 <b>1</b> +08	1.038+08	1.05 <b>E</b> +07
29	Cs-136	7.98 <b>E+</b> 06	3.141+07	2.11E+07	0.008+00	1.718+07	2.69E+06	2.538+06
30	Cs-137	4.908+08	6.51 <b>1+</b> 08	2.278+08	0.008+00	2.228+08	8.61E+07	9.278+06
	Ba-140	2.028+07	2.478+04	1.308+06	0.008+00	8.385+03	1.66B+04	3.11E+07
-	La-140	2.60 <b>8-02</b>	1.205-02	3.40B-03	0.008+00	0.00 <b>5</b> +00	0.00E+00	7.33 <b>8</b> +02
33	Ce-141	9.72 <b>E+0</b> 3	6.491+03	7.46E+02	0.008+00	3.06 <b>5</b> +03	0.00E+00	1.86E+07
34	Ce-144	8.72 <b>8</b> +05	3.618+05	4.688+04	0.008+00	2.15 <b>8+0</b> 5	0.00E+00	2.198+08

All nuclides (except H-3) calculated per ODCH equation 2.3-25 H-3 calculated per ODCH equation 2.3-30  $\,$ 

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Pathway = Heat

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#### Table 2.3-12

#### R VALUES FOR BRAVER VALLEY SITE

#### (sq meter-mrem/yr per uCi/sec)

		Age Grou	p = Child						
		Muclide	Bone	Liver	T. Body	Thyroid	Lidney	Lung	GI-LLI
	1	H-3	0.008+00	2.348+02	2.348+02	2.348+02	2.348+02	2.34 <b>E</b> +02	2.34E+02
	2	P-32	6.29E+09	2.94E+08	2.435+08	0.008+00	0.00E+00	0.00E+00	1.742+08
•		Cr-51	0.008+00	0.008+00	7.318+03	4.06E+03	1.118+03	7.411+03	3,888+05
		Kn-54	0.00E+00	5.66E+06	1.518+08	0.00E+00	1.592+06	0.008+00	4.758+06
		Fe-59	3.04E+08	4.913+08	2.458+08	0.00 <b>8+</b> 00	0.00E+00	1.428+08	5.128+08
		Co-57	0.008+00	4.218+06	8.528+06	0.008+00		0.00 <b>1</b> +00	3.45 <b>8+</b> 07
	7	Co-58	0.00E+00	1.288+07	3.91 <b>8+0</b> 7	0.008+00		0.00 <b>E+0</b> 0	7.45 <b>X+</b> 07
· .	8	Co-60	0.00E+00	4.728+07	1.391+08	0.008+00		0.008+00	2.611+08
	9	La-65	2.68E+08	7.158+08	4.448+08	0.00E+00		0.008+00	
	10	Rb-86	0.00E+00	4.87E+08	2. <b>998+</b> 08	0.008+00	0. <b>00E+0</b> 0	0.00E+00	3.13 <b>B</b> +07
	11	Sr-89	3.858+08	0.008+00	1.108+07	0.00E+00		0.00E+00	1.49 <b>8+0</b> 7
7	12	Sr-90	7.03 <b>E+</b> 09	0.001+00	1.788+09	0.00R+00	0.00 <b>x+0</b> 0	0.00 <b>8+00</b>	9,4 <b>71</b> +07
	19	¥-91	1.421+08	0.008+00	3.818+04	0.008+00	0.008+00	0.008+00	1.908+08
:	14	Zr-95	2.09 <b>E+</b> 06	4.598+05	4.09E+05	0.008+00	6.571+05	0.005+00	4.79 <b>2+08</b>
		Nb-95	2.54 <b>8</b> +06	9.90 <b>8+0</b> 5	7.07 <b>8+0</b> 5	0.00 <b>8</b> +00	9.30 <b>1</b> +05	0.00 <b>8+0</b> 0	1.832+09
		Nb-97					*******		******
	17	No-99	0.00E+00	9.79 <b>E+</b> 04	2.428+04	0.008+00		0.008+00	8.098+04
	18	Tc-99a	5.33 <b>8-21</b>	1.058-20	1.731-19	0.001+00		5.318-21	5.958-16
٠,	19	Ru-103	1.268+08	0.00E+00	4.858+07	0.001+00		0.00X+00	3.26E+09
	20	Ra-106	3.12 <b>E</b> +09	0.008+00	3.891+08	0.008+00	4.218+09	0.00 <b>1+0</b> 0	4.858+10
		Ag-110m	5.99E+06	4.048+06	3.238+06	0.008+00		0.008+00	
. '	22	Sb-124	0.00E+00	0.00E+00	0.008+00	0.008+00		0.00X+00	
		Sb-125	0.00E+00	0.002+00	0.00E+00	0.00E+00		0.00E+00	
		Te-127m	1.338+09	3.598+08	1.588+08	3.198+08		0.00E+00	1.082+09
. л	25	Te-129a	1.478+09	4.118+08	2.298+08	4.758+08	4.338+09	0.00 <b>E+0</b> 0	1.808+09
		I-131	1.41E+07	1.428+07	8.048+06	4.688+09		0.00E+00	
	27	I-133	4.84B-01	5.99 <b>8</b> -01	2.27E-01	1.118+02		0.001+00	<b>2.418-0</b> 1
	28	Ca-134	6.35 <b>E</b> +08	1.048+09	2.20E+08	0.00 <b>E+0</b> 0		1.16 <b>X+</b> 08	5.62 <b>E+06</b>
	29	Ca-136	1.38E+07	3.78 <b>8+</b> 07	2.45E+07	0.005+00		3.00 <b>X+0</b> 6	1.338+06
	30	Ca-137	9.028+08	8.635+08	1.275+08	0.008+00	2.815+08	1.018+08	5.40B+06
÷,		Ba-140	3.728+07	3.268+06	2.17 <b>1+0</b> 6	0.00E+00		1.948+04	1.898+07
	32	La-140	4.76 <b>8</b> -02	1.668-02	5.611-03	0.00E+00		0.001+00	4.638+02
		Ce-141	1.838+04	9.13 <b>8+</b> 03	1.36E+04	0.008+00		0.00E+00	1.148+07
	34	Ce-144	1.648+06	5.158+05	8.778+04	0.008+00	2.858+05	0.00 <b>2</b> +00	1.348+08

All nuclides (except H-3) calculated per ODCM equation 2.3-25 H-3 calculated per ODCM equation 2.3-30

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#### Table 2.3-13

#### R VALUES FOR BRAVER VALLEY SITE

#### (sq meter-mrem/yr per uCi/sec)

#### Pathway = Cow Hilk Age Group = Adult

	Nuclide	Bone	Liver	1. Body	Thyroid	fidney	Lung	GI-LLI
1	H-3	0.002+00	7.63 <b>E+0</b> 2	7.83E+02	7.63 <b>X+</b> 02	7.638+02	7.63 <b>E+0</b> 2	7.638+02
. 2	P-32	1.458+10	9.01E+08	5.608+08	0.001+00	0.008+00	0.00E+00	1.638+09
3	Cr-51	0.00E+00	0.00E+00	2.388+04	1.428+04	5.24 <b>8</b> +03	3.15 <b>8+04</b>	5.981+06
4	Kn-54	0.00E+00	5.958+06	1.138+06	0.00E+00	1.778+06	0.00E+00	1.821+07
5	Fe-59	2.40 <b>E+0</b> 7	5.638+07	2.16 <b>E+</b> 07	0.00B+00	0.008+00	1.57 <b>E+07</b>	1.881+08
. 6	Co-57	0.00E+00	9.108+05	1.518+06	0.008+00	0.00 <b>E+0</b> 0	0.002+00	2.318+07
- 7	Co-58	0.00E+00	3.672+06	8.22E+06	0.00 <b>2</b> +00	0.008+00	0.00 <b>E+0</b> 0	7.438+07
	Co-60	0.00E+00	1.128+07	2.461+07	0.008+00	0.00E+00	0.008+00	2.10 <b>8+08</b>
9	Zn-65	9.80E+08	3.128+09	1.418+09	0.008+00	2.091+09	0.00 <b>5+0</b> 0	1.96 <b>E+0</b> 9
10	Rb-86	0.002+00	2.19 <b>E</b> +09	1.028+09	0.00 <b>2</b> +00	0.00E+00	0.00 <b>E</b> +00	4.325+08
	Sr-89	1.168+09	0.001+00	3.338+07	0.008+00	0.008+00	0.00 <b>2+00</b>	1.862+08
	Sr-90	3.16 <b>8</b> +10	0.00 <b>E</b> +00	7.761+09	0.00E+00	0.001+00	0.00E+00	9.148+08
	Y-91	6.78 <b>8</b> +03		1.81 <b>E</b> +02	0.00E+00	0.005+00	0.00 <b>E+00</b>	3.738+06
-14	Zr-95	7.40 <b>E+0</b> 2	2.371+02	1.61E+02	0.00E+00	3.72 <b>8</b> +02	0.00 <b>E+0</b> 0	7.528+05
15	Nb-95	8.77 <b>E+</b> 04	3.77 <b>8</b> +04	2.03 <b>E+</b> 04	0.008+00	3.728+04	0.00 <b>1</b> +00	2.298+08
	Nb-97	2.818-12	7.11 <b>E</b> -13	2.60E-13	0.00 <b>E</b> +00	8.30 <b>2</b> -13	0.008+00	2.628-09
	Ho-99	0.00 <b>E+</b> 00	2.11 <b>E+0</b> 7	4.012+08	0.00 <b>E</b> +00	4.778+07	0.00E+00	4.861+07
	Tc-99a	2.83E+00		1.02E+02	0.00E+00	1.211+02	3.91E+00	4.73 <b>E</b> +03
	<b>Ra-103</b>	8.29E+02	0.005+00	3.57E+02	0.00E+00	3.16E+03	0.00E+00	9.681+04
. 20	Re-106	1.438+04	0.008+00	1.818+03	0.002+00	2.778+04	0.00E+00	9.278+05
	Ag-110m	4.168+07	3.648+07	2.28E+07	0.00 <b>E</b> +00	7.568+07	0.005+00	1.578+10
	Sb-124	0.00E+00	0.00E+00	0.008+00	0.002+00	0.005+00	0.00E+00	0.002+00
	Sb-125	0.008+00		0.002+00		0.002+00	0.00E+00	0.002+00
	Te-127s	3.44E+07	1.23E+07	4.198+08	8.792+08	1.408+08	0.00 <b>E+00</b>	1.152+08
25	Te-129	4.95 <b>8</b> +07	1.85 <b>E+</b> 07	7.848+06	1.70 <b>E</b> +07	2.071+08	0.00E+00	2.491+08
	I-131	2.52 <b>8+</b> 08	3.60 <b>8</b> +08	2.06B+08	1.162+11	8.17 <b>8</b> +08	0.00 <b>2+00</b>	9.508+07
	I-133	3.298+06	5.72 <b>E+0</b> 6	1.75E+06	8.41 <b>8</b> +08	9.99 <b>8</b> +06	0.001100	5.148+06
	Cs-134	3.89E+09	9.27 <b>8</b> +09	7.581+09	0.00 <b>E</b> +00	3.00 <b>8</b> +09	9.962+08	1.628+08
	Ca-136	2.23E+08	8.82 <b>X+</b> 08	6.351+08	0.00 <b>E+0</b> 0	4.918+08	6.73 <b>8+0</b> 7	1.001+08
30	Cs-137	4.998+09	6.82 <b>8+0</b> 9	4.478+09	0.00 <b>8+0</b> 0	2.328+09	7.70 <b>8</b> +08	1.321+08
	Ba-140	2.28 <b>E+</b> 07	2.87 <b>8+0</b> 4	1.49 <b>E+0</b> 6	0.008+00	9.74 <b>E+0</b> 3	1.641+04	4.708+07
	La-140	3.84E+00	1.93 <b>E+0</b> 0	5.11 <b>1-</b> 01	0.00 <b>E+0</b> 0	0.008+00	0.00E+00	1.42E+05
	Ce-141	3.99 <b>1</b> +03	2.70 <b>E+0</b> 3	3:062+02	0.00 <b>2+0</b> 0	1.25 <b>E+0</b> 3	0.001+00.0	1.03E+07
34	Ce-144	2.548+05	1.06E+05	1.36E+04	0.008+00	6.29E+04	0.008+00	8.58 <b>8+0</b> 7

All nuclides (except H-3) calculated per ODCM equation 2.3-24 H-3 calculated per ODCM equation 2.3-28

Beaver V	Valley	Power	Station
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### ODCM: GASEOUS EFFLUENTS

Title:

#### ATTACHMENT J Page 13 of 19 P&I ORGAN DOSE FACTORS

#### Table 2.3-14

#### R VALUES FOR BEAVER VALLEY SITE

#### (sq meter-mrem/yr per uCi/sec)

	Pathway = Age Group							
	Nuclide	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
1	8-3	0.00 <b>2+</b> 00	9.94 <b>5</b> +02	9. <b>942+0</b> 2	9.94E+02	9.94E+02	9.948+02	9.948+02
. st n <b>1</b>	P-32	2.671+10	1.668+09	1.048+09	0.008+00	0.00E+00	0.00E+00	2.251+09
	Cr-51	0.008+00	0.001+00	4.15E+04	2.31E+04	9.10E+03	5.93E+04	6.97E+06
		0.008+00	9.911+06	1.968+06	0.00E+00	2.95E+06	0.005+00	2.03E+07
	Fe-59	4.18E+07	9.765+07	3.778+07	0.00E+00	0.008+00	3.08E+07	2.318+08
6	Co-57	0.00 <b>E+0</b> 0	1.60 <b>E</b> +06	2.68E+06	0.00 <b>8</b> +00	0.008+00	0.00 <b>2</b> +00	2.98 <b>2</b> +07
1	Co-58	0.002+00	6.17 <b>5</b> +06	1.42B+07	0.00 <b>E+</b> 00	0.008+00	0.00 <b>E+00</b>	8.51E+07
8	Co-60	0.00E+00	1.898+07	4.268+07	0.00E+00	0.005+00	0.008+00	2.468+08
9	Za-85	1.518+09	5.238+09	2.44E+09	0.00E+00	3.34E+09	0.008+00	2.21E+09
- 10	Rb-86	0.002+00	3. <b>998+</b> 09	1.87 <b>E</b> +09	0.008+00	0.008+00	0.00 <b>8+0</b> 0	5.91 <b>8</b> +08
11	Sr-89	2.14 <b>8</b> +09	0.00 <b>E</b> +00	6.12E+07	0.00 <b>8</b> +00	0.00E+00	0.008+00	2.558+08
12	Sr-90	4.47 <b>8</b> +10	0.00B+00	1.10 <b>E</b> +10	0.00E+00	0.00E+00	0.002+00	1.258+09
.13	I I-91 👘	1.258+04	0.002+00	3.35E+02	0.005+00	0.00E+00	0.008+00	5.118+08
14	Zr-95	1.298+03	4.08E+02	2.81E+02	0.00E+00	6.00 <b>1+</b> 02	0.00 <b>E+00</b>	9.42B+05
- 15	Nb-95	1.168+05	6.41 <b>5</b> +04	3.53 <b>8</b> +04	0.008+00	6.21 <b>8</b> +04	0.00 <b>E+0</b> 0	2.74 <b>E+0</b> 8
16	Hb-97	5.13 <b>8-1</b> 2	1.278-12	4.658-13	0.00 <b>8</b> +00	1.49 <b>8</b> -12	0.00 <b>I</b> +00	3.048-08
17	Ko-99	0.00E+00	3.80 <b>1</b> +07	7.25 <b>£</b> +08	0.00 <b>E</b> +00	8.70E+07	0.00 <b>E+</b> 00	6.818+07
18	Tc-99s .	4.908+00	1.378+01	1.77 <b>5</b> +02	0.00E+00	2.04 <b>5</b> +02	7.59 <b>8</b> +00	8.96 <b>E</b> +03
19	Ru-103	1.478+03	0.008+00	6.30 <b>X+</b> 02	0.00E+00	5.208+03	0.00 <b>1</b> +00	1.238+05
20	Ru-106	2.03 <b>E</b> +04	0.002+00	3.328+03	0.008+00	5.08 <b>8+</b> 04	0.008+00	1.265+06
	Ag-110m	6.87 <b>8</b> +07	6.50 <b>8</b> +07	3.95 <b>8</b> +07	0.00B+00	1.248+08	0.00E+00	1.83 <b>E</b> +10
22	Sb-124	0.008+00	0.00 <b>1+0</b> 0	0.00E+00	0.00 <b>8+</b> 00	0.00E+00	0.002+00	0.008+00
	50-125	0.00E+00	0.008+00	0.00 <b>E+</b> 00	0.00E+00	0.00 <b>2</b> +00	0.00E+00	0.00 <b>2+</b> 00
	Te-127m	6.348+07	2.25 <b>1+0</b> 7	7.541+06	1.51 <b>E+</b> 07		0.00E+00	1.588+08
25	Te-129n	9.06 <b>I</b> +07	3. <b>368+0</b> 7	1.43 <b>E</b> +07	2.928+07	3.79 <b>5</b> +08	0.00 <b>2</b> +00	3.401+08
	I-131	4.57E+08	6.398+08	3.43 <b>8+</b> 08.		1.10 <b>E</b> +09	0.00E+00	1.262+08
	I-133		1.025+07	3.11 <b>8+06</b>	1.428+09	1.79 <b>5</b> +07	0.00 <b>R+00</b>	7.71 <b>E</b> +06
28	Co-134	6.76 <b>E+</b> 09	1.598+10	7.388+09		5.06 <b>8+</b> 09	1.938+09	1.988+08
- 29	Cs-136	3.80 <b>8+</b> 08	1.508+09	1.01 <b>E+0</b> 9	0.001+00	8.158+08	1.288+08	1.208+08
30	Cs-137	9.05 <b>8</b> +09	1.208+10	4.198+09	0.00 <b>5+0</b> 0	4.10 <b>5</b> +09	1.598+09	1.71 <b>E</b> +08
	Ba-140	4_128+07	5.058+04	2.65 <b>5+</b> 08	0.008+00	1.71 <b>8</b> +04	3.398+04	6.35E+07
	La-140	6.89E+00	3.39 <b>E+</b> 00	9.01 <b>8</b> -01	0.00E+00	0.00 <b>8</b> +00	0.00E+00	1.948+05
	Ce-141	7. <b>32E+</b> 03	4.89E+03	5.62 <b>8+0</b> 2	0.00 <b>5</b> +00	2.30 <b>E</b> +03	0.00 <b>x</b> +00	1.408+07
34	Ce-144	4.678+05	1,938+05	2.518+04	0.008+00	1.158+05	0.008+00	1.17 <b>8</b> +08

All nuclides (except H-3) calculated per ODCH equation 2.3-24 H-3 calculated per ODCH equation 2.3-28

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### ODCM: GASEOUS EFFLUENTS

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#### Table 2.3-15

#### R VALUES FOR BEAVER VALLEY SITE

#### (sq meter-mrem/yr per uCi/sec)

Pathway =	Cow Hilk
Age Group	= Child

	Nuclide	Bone	Liver	T. Body	Thyroid	Lidney	Lang	GI-LLI
1	8-3	0.00 <b>E+0</b> 0	1.578+03	1.578+03	1.578+03	1.578+03	1.578+03-0	1.578+03
2	P-32	6.598+10	3.09E+09	2.54E+09	0.00E+00	0.008+00	0.008+00	1.828+09
3	Cr-51	0.008+00	0.002+00	8.462+04	4.70E+04	1.288+04	8.581+04	4.498+06
- 4	Hn-54	0.008+00	1.488+07	3.958+06	0.00E+00	4.18X+06	0.001+00	1.248+07
5	Fe-59	9.708+07	1.578+08	7.821+07	0.005+00	0.00 <b>E</b> +00	4.558+07	1.638+08
6	Co-57	0.00 <b>8+00</b>	2.73 <b>E</b> +06	5.52 <b>X+0</b> 8	0.00 <b>E</b> +00	0.00 <b>E</b> +00	0.008+00	2.248+07
1	Co-58	0.00 <b>8+0</b> 0	9.438+06	2.89 <b>8</b> +07	0.00E+00	0.00 <b>1</b> +00	0.00E+00	5.50E+07
8	Co-60	0.00 <b>2+00</b>	2.941+07	8.67 <b>8+</b> 07	0.00E+00	0.002+00	0.00 <b>E+00</b>	1.63 <b>8</b> +08
9	Za-65	2.95 <b>8+</b> 09	7.878+09	4.89E+09	0.00E+00	4.961+09	0.00 <b>8+00</b>	1.38E+09
10	Rb-86	0.00 <b>2+</b> 00	7.408+09	4.55E+09	0.00E+00	0.003+00	0.00E+00	4.76E+08
	Sr-89	5.29 <b>8</b> +09	0.00 <b>2+0</b> 0	1.518+08	0.00E+00	0.00 <b>8+0</b> 0		2.05E+08
	Sr-90	7.558+10	0.00 <b>E+</b> 00	1.91 <b>E+1</b> 0	0.00 <b>E</b> +00	0.00 <b>1</b> +00		1.023+09
	Y-91	3.08 <b>8</b> +04	0.002+00	8.24 <b>8</b> +02	0.00 <b>1</b> +00	0.00 <b>5</b> +00		4.11 <b>8+</b> 06
	2r-95	3.00 <b>8+03</b>	6.60 <b>1+</b> 02	5.88 <b>E</b> +02	0.00E+00	9. <b>45E</b> +02		<b>6.895+</b> 05
15	Nb-95	2.61 <b>8+0</b> 5	1.028+05	7.26E+04	0.00 <b>E+</b> 00	9.548+04	0.00E+00	1.88X+08
	Nb-97	1.25 <b>E-1</b> 1	2.25 <b>8</b> -12	1.05E-12	0.00E+00	2.508-12		8.94E-07
	No-99	0.00 <b>E+0</b> 0	6.92 <b>E</b> +07	1.718+07	0.00 <b>2</b> +00	1. <b>485+</b> 08		5.72 <b>8+</b> 07
	Tc-99#	1.128+01	2.20 <b>8+0</b> 1	3.85 <b>8</b> +02	0.00 <b>2+</b> 00	3.20 <b>8</b> +02		1.258+04
	Ru-103	3.498+03	0.00 <b>E</b> +00	1.348+03	0.00 <b>5+00</b>	8.788+03		9.01 <b>8</b> +04
20	Ru-106	6.49 <b>E</b> +04	0.002+00	8.10 <b>5+03</b>	0.00 <b>8</b> +00	8.76 <b>2+04</b>	0.001+00	1.01 <b>E</b> +06
	Ag-110m	1.492+08	1.018+08	8.058+07	0.008+00	1.878+08	0.008+00	
	Sb-124	0.00 <b>E</b> +00	0.008+00	0.00 <b>1</b> +00	0.00E+00	0.00E+00	0.008+00.0	
	Sb-125	0.008+00	0.001+00	0.00E+00	0.00 <b>E+</b> 00	0.008+00	0.001+00.	
	Te-127a	1.568+08	4.218+07	1.862+07	3.74E+07	4.468+08	0.00 <b>8+0</b> 0:	
25	Te-129 <b>u</b>	2.23 <b>5+08</b>	6.24E+07	3.478+07	7.20 <b>E</b> +07	6.56E+08	0.00 <b>8+00</b>	2.728+08
	I-131	1.11 <b>8+09</b>	1.118+09	6.33 <b>E</b> +08	3.68E+11	1.832+09		9.92 <b>8</b> +07
_	I-133	1.46 <b>8+</b> 07	1.818+07	6.831+06	3.368+09			7.26 <b>E</b> +06
	Cs-134	1.56 <b>E+1</b> 0	2.56 <b>1</b> +10	5.401+09	0.00 <b>E+0</b> 0	7.931+09		L 382+08
	Ca-138	8.58 <b>E+0</b> 8	2.362+09	1.532+09	0.00E+00	1.262+09		3.29 <b>8+</b> 07
30	Cs-137	2.182+10	2.098+10	3.08E+09	0.002+00	6.60E+09	2.458+09	1.318+08
	Ba-140	9.94 <b>8+</b> 07	8.718+06	5.80 <b>1</b> +06	0.00 <b>2+0</b> 0	2.848+04		5.04 <b>8</b> +07
	La-140	1.658+01	5.77 <b>E</b> +00	1.94E+00	0.00 <b>E+0</b> 0	0.00E+00		1.618+05
	Ce-141	1.80 <b>E+04</b>	8.99 <b>8+</b> 03	1.348+04	0.008+00	3.94 <b>E</b> +03		L.12E+07
34	Ce-144	1.158+06	3.618+05	6.15 <b>8</b> +04	0.00 <b>1</b> +00	2.008+05	0.002+00	9. <b>418+</b> 07

All nuclides (except H-3) calculated per ODCM equation 2.3-24' H-3 calculated per ODCM equation 2.3-28

Title:

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Pathway = Cow Milk

rocedure	Number:	'

Title:	

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### ODCM: GASEOUS EFFLUENTS

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#### Table 2.3-16

#### B VALUES FOR BRAVER VALLEY SITE

#### (sq meter-mrem/yr per uCi/sec)

						3		
	Age Group	= Infant						
	Muclide	Bone	Liver	T. Body	Thyroid	Lidney	Long	GI-LLI
1	H-3	0.00 <b>2+</b> 00	2.38 <b>8</b> +03	2.388+03	2.38 <b>8</b> +03	2.38 <b>E</b> +03	2.385+03	2.38 <b>8+03</b>
2	P-32	1.368+11	7.991+09	5.278+09	0.008+00	0.00E+00	0.008+00	1.841+09
3	Cr-51	0.002+00	0.008+00	1.348+05	8.75E+04	1.91 <b>8</b> +04	1.70 <b>8</b> +05	3.91 <b>8+06</b>
4	Kn-54	0.00 <b>1+</b> 00	2.768+07	6.258+06	0.00 <b>8</b> +00	8.11 <b>X+</b> 08	0.00E+00	1.011+07
5	Fe-59	1.812+08	3.16 <b>8</b> +08	1.258+08	0.008+00	0.001+00	9.358+07	1.518+08
6	Co-57	0.00E+00	6.36 <b>E+</b> 06	1.03E+07	0.00 <b>E+0</b> 0	0.008+00	0.00 <b>8</b> +00	2.178+07
7	Co-58	0.008+00	1.898+07	4.7 <b>98+</b> 07	0.00 <b>E+00</b>	0.005+00	0.00 <b>5</b> +00	4.70 <b>8</b> +07
8	Co-60	0.00E+00	6.00 <b>8+</b> 07	1.428+08	0.00 <b>5+</b> 00	0.001+00	0.008+00	1.438+08
9	Za-65	3.97E+09	1.36 <b>E+1</b> 0	6.27 <b>5</b> +09	0.00 <b>8</b> +00	6.60 <b>1+</b> 09	0.008+00	1.158+10
10	Rb-86	0.00E+00	1.888+10	9.288+09	0.008+00	0.00 <b>E</b> +00	0.008+00	4.818+08
11	Sr-89	1.018+10	0.00 <b>8+0</b> 0	2.89 <b>E</b> +08	0.008+00	0.008+00	0.00 <b>8</b> +00	2.07 <b>E+08</b>
12	Sr-90	8.228+10	0.00E+00	2.098+10	0.005+00	0.00E+00	0,008+00	1.03E+09
13	Y-91	5.79 <b>E+</b> 04	0.00 <b>E+00</b>	1.548+03	0.00 <b>8</b> +00	0.008+00	0.00 <b>E+0</b> 0	4.158+06
- 14	2r-95	5.338+03	1.30 <b>E+03</b>	9. <b>228+0</b> 2	0.00 <b>8+00</b>	1.40 <b>8</b> +03	0.00 <b>E+00</b>	6. <b>472+0</b> 5
15	Nb-95	4.87E+05	2.01 <b>E</b> +05	1.168+05	0.00 <b>8</b> +00	1.448+05	0.00 <b>E</b> +00	1.69 <b>E+08</b>
	¥6-97	2.63X-11	5.62 <b>8-</b> 12	2.038-12	0.00 <b>E+00</b>	4.398-12	0.00 <b>E+00</b>	1.778-06
	Mo-99	0.00 <b>E</b> +00	1.77 <b>8</b> +08	3. <b>45E</b> +07	0.00 <b>E+</b> 00	2. <b>642</b> +08	0.00 <b>2+00</b>	5.638+07
18	Tc-99a	2.34E+01	4.828+01	6.21 <b>E</b> +02	0.00 <b>8+00</b>	5.19E+02	2.528+01	1.40 <b>1+</b> 04
19	Ru-103	7.062+03	0.00 <b>E+</b> 00	2.36E+03	0.008+00	1.47 <b>5+</b> 04	0.00 <b>E+</b> 00	8.59 <b>X+04</b>
20	Ru-106	1.348+05	0.00B+00	1.67 <b>E</b> +04	0.008+00	1.588+05	0.008+00	1.012+06
	Ag-110m	2.758+08	2.01 <b>E+08</b>	1.338+08	0.00 <b>5+</b> 00	2.888+08	0.005+00	1.048+10
22	Sb-124	0.005+00	0.00 <b>E+0</b> 0	0.008+00	0.00 <b>E</b> +00	0.00 <b>E+0</b> 0	0.00 <b>E+00</b>	0.002+00
23	Sb-125	0.008+00	0.008+00	0.00 <b>1</b> +00	0.00 <b>E+</b> 00	0.00E+00	0.00 <b>E+0</b> 0	0.001+00
24	Te=127m	3.16E+08	1.05 <b>E+08</b>	3.83E+07	9.148+07	7.79 <b>E</b> +08	0.00 <b>E+</b> 00	1.28 <b>E+</b> 08
25	Te-129a	4.58E+08	1.57 <b>8+08</b>	7.068+07	1.768+08	1.15 <b>X+</b> 09	0.00 <b>8</b> +00	2.7 <b>48</b> +08
26	I-131	2.31 <b>X+</b> 09	2.728+09	1.20E+09	8.95 <b>E</b> +11	3.18 <b>8</b> +09	0.00E+00	9.72 <b>8</b> +07
21	I-133	3.08E+07	4.49 <b>8+</b> 07	1.31 <b>E+0</b> 7	8.17 <b>8+09</b>	5.28 <b>E+0</b> 7	0.00 <b>E</b> +00	7.601+06
28	Ca-134	2.51 <b>E</b> +10	4.69E+10	4.73E+09	0.00 <b>1</b> +00	1.215+10	4.95E+09	1.278+08
29	Ca-136	1.68E+09	4.93B+09	1.84 <b>E</b> +09	0.001+00	1.978+09	4.02E+08	7.498+07
30	Cs-137	3.48E+10	4.07B+10	2.898+09	0.008+00	1.092+10	4.438+09	1.278+08
	Ba-140	2.05E+08	2.058+05	1.058+07	0.00 <b>8+0</b> 0	4.868+04	1.268+05	5.02 <b>8+0</b> 7
	La-140	3.45 <b>E</b> +01	1.36 <b>8+</b> 01	3.508+00	0.00 <b>1</b> +00	0.00 <b>E</b> +00	0.00 <b>8+00</b>	1.602+05
	Ce-141	3.57 <b>8</b> +04	2.18 <b>8+04</b>	2.57 <b>8+</b> 03	0.005+00	6.72 <b>8</b> +03	0.00 <b>8+00</b> -	
34	Ce÷144	1.65 <b>8</b> +06	6.75 <b>8</b> +05	9.258+04	0.008+00	2.738+05	0.00 <b>E</b> +00	9.47 <b>8</b> +07

All nuclides (except H-3) calculated per ODCM equation 2.3-24 H-3 calculated per ODCM equation 2.3-28

Beave	r Valle	ev Po	wer	Stati	on	÷	Pro	cedure Nu		
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Title:							Un	it: 1/2	Level Of Use: In-Field Reference	
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		De		•		CTOPS	,			
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				Table 2.3-	17					1
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			R VALUES	FOR BRAVER	VALLEY SIT	1				
-				4 10 -						<b>.</b>
			(sq met	er-area/yr	per aCi/sec	:)				
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$							$(\frac{1}{2}, \frac{1}{2}, $			
tic: DDCM: GASEOUS EFFLUENTS ATTACHMENT J Page 16 of 19 P&I ORGAN DOSE FACTOF Relie 2.3-17 R VALUES FOR BLAYER VALLEY SITT (sq mater-area/yr per sC1/sec) Pathway : Goat Hilt Reclide Bane Liver T. Body Thyroid Liden 1 B-3 0.008400 1.568403 1.568403 1.568403 1.568403 1.568403 3 Cr-51 0.008400 0.008400 1.568403 1.568403 1.568403 1.568403 3 Cr-51 0.008400 0.008400 1.568403 1.568403 1.568403 1.568403 3 Cr-51 0.008400 0.008400 1.568403 1.568403 1.568403 1.568403 1.568404 3 Cr-51 0.008400 0.008400 1.568403 1.568403 1.568403 0.00840 3 Cr-51 0.008400 0.008400 1.568403 1.568403 0.00840 0.00840 5 Fe-59 3.122405 7.322405 2.381405 0.008400 0.00840 5 Co-57 0.008400 1.368405 2.681405 0.008400 0.00840 8 Co-60 0.001400 1.368405 2.681405 0.008400 0.00840 8 Co-60 0.0001400 1.368405 2.681405 0.008400 0.00840 8 Co-60 0.000140 1.368405 0.008400 0.00840 8 Co-60 0.000140 1.368405 0.008400 0.00840 8 Co-60 0.000140 0.008400 0.00840 8 Co-60 0.008400 0.2188401 0.00840 0.00840 8 Co-										
-	Nuclide	Bone	Liver	T. Body	Thyroid	Lidney	Lung	61-LLI		
										1
							1.568+03	1.56E+03		
							0.00E+00 3.78E+03	1.961+09		
							0.002+00	7.17 <b>8</b> +05 2.19 <b>8</b> +06	•	
							2.058+05	2.44 <b>E</b> +06		
	•••••	0.120.00	11000100	21012100			2.000.00	e.118.44		
	6 Co-57	0.008+00	1.098+05	1.828+05	0.00E+00	0.002+00	0.00E+00	2.77B+08		
	7 Co-58	0.00E+00	4.401+05	9.86E+05	0.00E+00	0.00E+00	0.008+00	8.91 <b>1</b> +06		
						0.00E+00	0.00 <b>E+00</b>	2.52B+07		
						2.50 <b>E+0</b> 8	0.008+00	2.361+08		< 3
	10 Rb-86	0.008+00	2.638+08	1.228+08	0.008+00	0.00E+00	0.008+00	5.18 <b>8+</b> 07		1
	11 Ce-89	2 438400	0.008400	6 008107	0 008.00	0.008100	0.00E+00	3 018409		
							0.008+00	3.91E+08 1.92E+09		
							0.008+00	4.488+05		
							0.008+00	9.028+04		
						4.47E+03		2.74E+07		
						9.96B-14	0.008+00	3.15E-10		
						5.728+06	0.00 <b>E+</b> 00	5.868+06		
							4.70B-01	5.67 <b>E</b> +02		
						3.80 <b>2</b> +02	0.001+00	1.168+04		
	20 Ru-106	1.728+03	0.00 <b>E+00</b>	2.18 <b>8</b> +02	0.00 <b>8+</b> 00	3.328+03	0.008+00	1.118+05		Í
•	A1 1. 14A2	4 009-00		6 748.64	A 460-44	A A78.AA	AA.#AA A	1-000-00		
							0.008+00		•	
	22 Sb-124	0.0000400	0.008+00	0.008+00	8 0910400	0_008+00	0.008+00	0.0000+00		

Ali nuclides (except E-3) calculated per ODCM equation 2.3-24 H-3 calculated per ODCM equation 2.3-26

3.05E+04 1.27E+04 1.64E+03 0.00E+00

23 Sb-125

24 Te-127m

25 Te-129a

26 I-131 ··

27 1-133

28 Cs-134

29 Cs-136

30 Cs-137

31 Ba-140

32 La-140

33 Ce-141

34 Ce-144

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0.00E+00

4.138+06

5,948+06

3.02E+08

3.958+06

4.678+08

6.70E+08

1.508+10

0.008+00

1.481+06

2.221+06

4.328+08

6.878+06

2.74E+06 3.44E+03 1.79E+05 4.60E-01 2.32E-01 6.13E-02

4.798+02 3.248+02 3.688+01

1.11E+09 9.09E+08

2.658+09 1.908+09

2.05E+10 1.34E+10

0.008+00

5.038+05

9.418+05

2.488+08

2.095+06

0.00E+00

1.051+08

2.048+06

1.018+09

0.008+00

0.00E+00

0.008+00

0.00E+00

0.008+00

0.00E+00

0.008+00

1.681+07

2.488+07

1.208+07

3.60E+08

1.471+09

6.95**E**+09

1.17E+03

0.00E+00

1.51E+02

7.558+03

1.42E+11 7.40E+08

0.00E+00

0.00E+00

0.008+00

0.00E+00

0.008+00

1.19E+08

2.02E+08

2.318+09 3.968+08

1.978+03 5.648+06

0.008+00= 1.708+04

0.008+00 1.248+06

0.00E+00 1.03E+07

0.008+00

1.388+07

2.998+07

1.14E+08

6.17E+06

1.95E+07

3.018+08

Pathway = Goat Milk

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### ATTACHMENT J Page 17 of 19 P&I ORGAN DOSE FACTORS

#### Table 2.3-18

#### R VALUES FOR BRAVER VALLEY SITE

#### (sq meter-mrem/yr per uCl/sec)

	Age Group	= Teen				1.17	- :	
	Nuclide	Bose	Liver	T. Body	Thyroid	Lidney	Lung	GI-LLI
· 1	8-3	0.00E+00	2.038+03	2.038+03	2.03E+03	2.03 <b>E+0</b> 3	2.038+03	2.03 <b>E</b> +03
	P-32	3.21 <b>E</b> +10	1.998+09	1.248+09	0.008+00	0.008+00	0.008+00	2.708+09
3	Cr-51	0.002+09	0.008+00	4.988+03	2.778+03	1.098+03	7.118+03	8.378+05
	Mn-54	0.00E+00	1.198+06	2.368+05	0.008+00	3.558+05	0.00E+00	2.448+06
	Je-59	5.448+05	1.278+06	4.90E+05	0.00 <b>E+0</b> 0	0.00 <b>8+00</b>	4.008+05	3.00 <b>8</b> +06
. 6	Co-57 .	0.00E+00	1.928+05	3.21E+05	0.002+00	0.002+00	0.008+00	3.578+06
7	Co-58	0.002+00	7.40 <b>8</b> +05	1.718+08	0.002+00	0.00E+00	0.00 <b>2+00</b>	1.02E+07
8	Co-60	0.008+00	2.27 <b>8</b> +06	5.118+08	0.00E+00	0.001+00	0.005+00	2.968+07
9	Za-65	1.818+08	6.271+08	2.93 <b>E</b> +08	0.00E+00	4.018+08	0.008+00	2.661+08
10	Rb-86	0.001+00	4.79 <b>8</b> +08	2.25 <b>8</b> +08	0.008+00	0.00E+00	0.008+00	7.09B+07
- 11	Sr-89	4.498+09	0.00 <b>E</b> +00	1.298+08	0.00 <b>2</b> +00	0.008+90	0.00 <b>8+0</b> 0	5.35 <b>E+08</b>
12	Sr-90	9.39E+10	0.00 <b>5</b> +00	2.32E+10	0.00E+00	0.001+00	0.008+00	2.64 <b>8+0</b> 9
13	Y-91	1.50E+03	0.008+00	4.01E+01	0.00E+00	0.008+00	0.00E+00	6.14 <b>E+</b> 05
14	Zr-95	1.55E+02	4.90E+01	3.37E+01	0.00E+00	7.198+01	0.00E+00	1.132+05
15	¥b-95	1.398+04	7. <b>691</b> +03	4.23E+03	0.00E+00	7. <b>458+0</b> 3	0.00E+00	3.29E+07
	Nb-97	6.15 <b>5-</b> 13	1.538-13	5.578-14	0.00E+00		0.008+00	3.65E-09
	No-99	0.00E+00	4.568+06	8.70 <b>8+05</b>	0.00 <b>E+0</b> 0	1.04 <b>E+0</b> 7	0.00 <b>E+0</b> 0	8.17 <b>X</b> +06
	Tc-99	5.88 <b>X-</b> 01	1.641+00	2.13 <b>E</b> +01	0.00 <b>E+0</b> 0	2.45 <b>E+0</b> 1	9.11 <b>E-0</b> 1	1.088+03
19	Ru-103	1.778+02	0.001+00	7.56 <b>E</b> +01	0.008+00	6.245+02	0.002+00	1.482+04
-20	Ru-108	2.448+03	0.002+00	3.98E+02	0.00 <b>8</b> +00	6.105+03	0.008+00	1. <b>528+05</b>
	Ag-110m	8.248+06	7.802+06	4.75 <b>8</b> +08	0.008+00	1.498+07	0.008+00	2.198+09
	Sb-124	0.008+00	0.00 <b>1</b> +00	0.008+00	0.00 <b>E+</b> 00	0.001+00	0.00 <b>1+00</b>	0.00 <b>8</b> +00
23	Sb-125	0.00E+00	0.00 <b>E</b> +00	0.002+00	0.00 <b>E+00</b>	0.00E+00	0.001+00	0.008+00
24	Te-127m	7.812+06	2.70E+08	9.05 <b>8</b> +05	1.818+06	3.08 <b>5+07</b>	0.00 <b>2+0</b> 0	1.908+07
25	Te-129m	1.095+07	4.038+06	1.72 <b>2+</b> 06	3.518+06	4.558+07	0.008+00	4.08 <b>E</b> +07
26	I-131	5.485+08	7.67E+08	4.12E+08	2.24 <b>E</b> +11	1.328+09	0.00E+00	1.528+08
	I-133	7.218+06	1.228+07	3.732+06			0.00 <b>2+00</b>	9.268+06
	Cs-134		1.91 <b>E+</b> 09	8.86E+08		6.07 <b>2+0</b> 8	2.32 <b>8+0</b> 8	2.388+07
29	Ce-136	1.141+09	4.49E+09	3.02 <b>E+</b> 09	0.00 <b>E+</b> 00	2.44 <b>E+0</b> 9	3.851+08	3.61E+08
30	Cs-137	2.718+10	3.61E+10	1.268+10	0.008+00	1.23 <b>6+1</b> 0	4.778+09	5.148+08
	Ba-140	4.948+06	6.06 <b>8</b> +03	3.18 <b>8</b> +05	0.00 <b>E+</b> 00	2.058+03	4.078+03	7.628+06
		8.278-01	4:06E-01	1.08 <b>K-</b> 01		0.00 <b>E+00</b>	0.00 <b>E+0</b> 0	2.33 <b>8+04</b>
	Ce-141	8.798+02	5.878+02	6.7 <b>48+</b> 01	0.00 <b>5</b> +00	2.768+02	0.008+00	1.688+06
34	Ce-144	5.601+04	2.328+04	3.01 <b>E+</b> 03	0.00 <b>E+</b> 00	1.398+04	0.008+00	1.41 <b>E+0</b> 7

All nuclides (except H-3) calculated per ODCH equation 2.3-24 H-3 calculated per ODCH equation 2.3-28

Beaver Valley Power Station	Procedure N	umber: 1/2-ODC-2.02	
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P&I ORGAN DOSE FACTORS			

#### Table 2.3-19

#### R VALUES FOR BEAVER VALLEY SITE

#### (sq meter-mrem/yr per aCi/sec)

#### Pathway = Goat Milk Age Group = Child

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	Huclide	Bone	Liver	T. Body	Thyroid	Lidney	Lung.	GI-LLI
1	E-3	0.00 <b>1</b> +00	3.20 <b>E</b> +03	3.20E+03	3.20E+03	3.20 <b>5+0</b> 3	3.20E+03	3.20 <b>8</b> +03
2	P-32	7.91 <b>X</b> +10	3.70E+09	3.05E+09	0.00E+00	0.00E+00	0.00E+00	2.192+09
3	Cr-51	0.00X+00	0.00E+00	1.028+04	5.64E+03	1.548+03	1.03E+04	5.398+05
4	Ha-54	0.00E+00	1.788+06	4.74E+05	0.00E+00	4.998+05	0.008+00	1.498+06
5	Fe-59	1.268+06	2.048+06	1.028+06	0.008+00	0.008+00	5.918+05	2.128+06
.6	Co-57	0.00 <b>1</b> +00	3.27E+05	6.83E+05	0.00 <b>8</b> +00	0.008+00	0.00E+00	2.68 <b>8+</b> 06
1	Co-58	0.00E+00	1.138+06	3.488+06	0_00 <b>8+0</b> 0	0.008+00	0.00 <b>8+00</b>	6.601+06
6	Co-60	0.00E+00	3.53E+06	1.04E+07	0.00 <b>1</b> +00	0.008+00	0.00R+00	1.958+07
- 9	Zn-65	3.54E+08	9.44B+08	5.87E+08	0.002+00	5.958+08	0.00E+00	1.66 <b>E</b> +08
10	Rb-86	0.00 <b>E+0</b> 0	8.888+08	5.462+08	0.001+00	0.008+00	0.008+00	5.71B+07
	Sr-89	1.118+10	0.00 <b>E</b> +00	3.17 <b>E</b> +08	0.00E+00	0.008+00	0.00 <b>E+00</b>	4.30E+08
-	Sr-90	1.59 <b>R</b> +11	0.008+00	4.028+10	0.00 <b>E+0</b> 0	0.002+00	0.00E+00	2.142+09
	Y-91	3.70 <b>E+0</b> 3	0.00E+00	9.898+01	0.008+00	0.001+00	0.00E+00	4.938+05
	Zr-95	3.608+02	7.928+01	7.05E+01	0.008+00	1.138+02	0.00E+00	8.27 <b>8</b> +04
15	86-95	3.138+04	1.228+04	8.71E+03	0.00E+00	1.14 <b>R</b> +04	0.008+00	2.258+07
	lib-97	1. <b>49E-12</b>	2.70E-13	1. <b>268-</b> 13	0.00 <b>8</b> +00	2.99 <b>8-</b> 13	0.00 <b>8+00</b>	8.33 <b>E</b> -08
	No-99		8.30E+06	2.05B+06	0.00E+00	1.77 <b>8+</b> 07	0.00E+00	6.87E+06
	Tc-99m	1.35E+00	2.658+00	4.398+01	0.00 <b>E+0</b> 0	3.84 <b>8</b> +01	1.34 <b>8+0</b> 0	1.518+03
	<b>Ru-103</b>	4.18 <b>E+</b> 02	0.00 <b>E+00</b>	1.618+02	0.00 <b>8</b> +00	1.058+03	0.00E+00	1.088+04
20	Ru-106	7.79 <b>8</b> +03		9.72 <b>E</b> +02	0.001+00	1.058+04	0.008+00	1.218+05
	Åg-110m	1.798+07	1.218+07	9.65 <b>8+06</b>	0.00E+00	2.25E+07	0.00E+00	1.448+09
	Sb-124	0.00 <b>2+0</b> 0.		0.001+00	0.008+00	0.001+00.	0.008+00	
23	Sb-125	0.00E+00	0.00E+00	0.00E+00	0.008+00	0.001+00	0.002+00	0.00E+00
24	Te-127m	1.861+07.	5. <b>058</b> +06		4.488+08	5.35E+07	0.008+00 ··	1.528+07
25	Te-129m	2.688+07	7.48E+06	4.168+06	8.641+06	7.878+07	0.00E+00	3.278+07
	I-131	1.338+09	1.348+09	7.60E+08	4.428+11	2.198+09	0.00E+00	1,198+08
	I-133	1.758+07	2.178+07	8.20 <b>8+</b> 06	4.03E+09	3.611+07	0.00 <b>8+00</b> (	8.73 <b>8</b> +06
	Cs-134	1.87E+09	3.07 <b>E</b> +09	8.48 <b>8</b> +08	0.00E+00	9.52 <b>8</b> +06	3.42 <b>8+08</b> -	1.66 <b>8</b> +07
29	Cs-136	2.58E+09	7.08 <b>E</b> +09	4.58 <b>8</b> +09	0.00 <b>E+</b> 00	3.778+09	5.628+08	2.491+08
30	Ca-137	6.548+10	6.26 <b>R</b> +10	9.248+09	0.00 <b>E+</b> 00	2.04E+10	7.34E+09	3.928+08
	Ba-140	1.198+07	1.058+06	6.96 <b>8</b> +05	0.00E+00	3.408+03	6.238+03	6.041+06
	La-140	1.985+00	6.92 <b>8-</b> 01	2.33X-01	0.00E+00	0.002+00	0.005+00	
	Ce-141	2.188+03	1.082+03	1.60E+03	0.008+00	4.73E+02	0.008+00	
34	Ce-144	1.388+05	4.338+04	7.371+03	0.008+00	2.408+04	0.008+00	1.138+07

All nuclides (except H-3) calculated per ODCH equation 2.3-24 R-3 calculated per ODCH equation 2.3-28

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le:				- <u>, , , , , , , , , , , , , , , , , , ,</u>	Unit		Level Of Use: In-Field Reference
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			(F)) (F) I			2	109 of 130
	P&I	ATTACHN Page 19 ORGAN DO	of 19	TORS	<i>.</i>	•	
ł							i i
			<b>^</b>				
	and the second sec	Table 2.3-		*			
-		R VALUES FOR BRAVER (sq meter-mrem/yr					
	Pathway = Goat Milk	foð moser minnvir	Act Actions)				
	Age Group = Infant			•••			
	Nuclide Bone	Liver T. Body	Thyroid	Lidney	Lung	GI-LLI	
	1 H-3 0.008+00 2 P-32 1.638+11 3 Cr-51 0.008+00 4 Mn-54 0.008+00 5 Fe-59 2.358+06	4.868+03 4.868+03 9.598+09 6.328+09 0.008+00 1.618+04 3.318+06 7.508+05 4.118+06 1.628+06	1.058+04 0.008+00	0.00 <b>8</b> +00 ( 2.29 <b>8</b> +03 2 7.33 <b>8</b> +05 (	1.868+03 ).008+00 2.048+04 ).008+00 1.218+06	4.868+03 2.218+09 4.698+05 1.218+06 1.968+06	
	6 Co-57 0.00E+00	7.64E+05 1.24E+06			.00 <b>£</b> +00	2.60E+06	
	7 Co-58 0.00E+00 8 Co-60 0.00E+00	2.268+06 5.648+06 7.208+08 1.708+07	0.00E+00	0.008+00 0	).00 <b>2+0</b> 0 ).00 <b>2+0</b> 0	5.64 <b>8+0</b> 8 1.71 <b>8+0</b> 7	
	9 Za-65 4.76E+08 10 Rb-86 0.00E+00	1.638+09 7.538+08 2.258+09 1.118+09			).00 <b>2+0</b> 0 ).00 <b>2+00</b>	1.38 <b>8+</b> 09 5.77 <b>8+</b> 07	
	11 Sr-69 2.11 <b>R</b> +10 12 Sr-90 1.73 <b>R</b> +11 13 Y-91 6.94 <b>B</b> +03	0.008+00 8.068+08 0.008+00 4.398+10 0.008+00 1.858+02	0.00 <b>5</b> +00 0.00 <b>5</b> +00	0.008+00 0 0.008+00 0	.00 <b>2+</b> 00 .00 <b>2+0</b> 0 .00 <b>2+0</b> 0	4.34E+08 2.16E+09 4.98E+05	
	14 <b>Zr-95</b> 6.40 <b>E</b> +02 15 <b>Nb-95</b> 5.84 <b>E</b> +04	1.56E+02 1.11E+02 2.41E+04 1.39E+04			).00 <b>2+0</b> 0 ).00 <b>2+0</b> 0	7. <b>778+04</b> 2.03 <b>8</b> +07	
	16 Hb-97 3.16E-12 17 Ho-99 0.00E+00 18 Tc-99m 2.81E+00 19 Eu-103 8.47E+02 20 Eu-106 1.60E+04	6.74E-13 2.43E-13 2.12E+07 4.14E+06 5.79E+00 7.46E+01 0.00E+00 2.63E+02 0.00E+00 2.00E+03	0.008+00 0.008+00 0.008+00	6.23 <b>5</b> +01 3 1.768+03 0	.00E+00 .03E+00 .00E+00	2.13E-07 6.99E+06 1.66E+03 1.03E+04 1.22E+05	
	21 Ag-110m 3,30E+07	2.418+07 1.608+07		•	.008+00	1.258+09	
	22 Sb-124 0.00E+00 23 Sb-125 0.00E+00 24 Te-127m 3.80E+07 25 Te-123m 5.50E+07	0.008+005 0.008+00 0.008+00 0.008+00 1.268+07 4.598+06 1.898+07 8.478+06	0.008+00 0.008+00 1.108+07	0.008+00 0 0.008+00 0 9.358+07 0	.00E+00 .00E+00 .00E+00 .00E+00	0.00E+00 0.00E+00 1.53E+07 3.28E+07	
•	26         I-131         2.778+09           27         I-133         3.708+07           28         Cs-134         3.028+09           29         Cs-136         5.038+09	3.27E+09 1.44E+09 5.39E+07 1.50E+07 5:62E+09 5.68E+08 1.48E+10 5.52E+09	9.801+09 0.001+00	8.34 <b>8+07</b> 0 1.45 <b>8+09</b> 5	00E+00 00E+00 93E+08 21E+09	1.17E+08 9.12E+06 1.53E+07 2.25E+08	
•	30 Co-137 1.04E+11				.332+10	3.822+08	· · · ·
	33 Ce-141 4.29E+03	2.45E+04       1.26E+06         1.63E+00       4.19E-01         2.62E+03       3.06E+02         8.11E+04       1.11E+04	0.00 <b>1+00</b> 0.00 <b>1+00</b>	0.008+00 0 3.078+02 0	.518+04 .008+00 .008+00 .008+00	6.038+06 1.928+04 1.358+06 1.148+07	
	All nuclides (except		DCM equation	2.3-24			
	E-3 calculated per OD	LD EQUATION 2.3-28					
		. <b>.</b>					

	F	Beav	er Va	Procedure Nur	nber: /2-ODC-2.02	<u> </u>			
itle:				<u> </u>			Unit: 1/2 Revision:	Z-ODC-2.02 Level Of Use: In-Field Reference Page Number:	
DDC	CM: GAS	EOUS	EFFLU	JENTS		· · · · · · · · · · · · · · · · · · ·	2	110 of 130	
		CONT	FINUO	US RELEA	Page	HMENT K e 1 of 7 SITION PARAM	IETERS (0-5 M	ILES)	
			4.5 - 5.0	2.15E-10 3.74E-10 6.42E-10	3.89E-10 5.10E-10 3.00E-10	2.43E-10 1.80E-10 2.20E-10 1.51E-10 2.08E-10 2.08E-10	1.78E-10 1.75E-10 1.80E-10 1.71E-10 1.71E-10		
		-	4.0 - 4.5	2.63E-10 4.56E-10 7.85E-10	6.72E-10 4.15E-10 3.25E-10	2.93E-10 2.19E-10 2.68E-10 1.84E-10 2.54E-10 2.54E-10	2.17E-10 1.12E-10 1.12E-10 2.09E-10 1.73E-10		
	-		41LES 3.5 - 4.0	3.29E-10 5.23E-10 6.13E-10	6.78E-10 7.83E-10 5.05E-10	4.40E-10 3.29E-10 3.96E-10 1.98E-10 2.50E-10	2.98E-10 2.68E-10 1.10E-10 2.10E-10 2.16E-10 2.16E-10		
	) FOR 50 HRS/QTR		HE CONTROL LOCATIONS, IN MILES           2.0 - 2.5         2.5 - 3.0         3.0 - 3.5         3.5	4.24E-10 6.75E-10 1.23E-09	1.21E-09 1.01E-09 5.65E-10	5.68E-10 4.25E-10 5.12E-10 2.55E-10 1.57E-10	3.84E-10 1.37E-10 1.93E-10 3.37E-10 2.79E-10		1.
	ETERS (D/Q S/YR OR >1		ROL LOCA' 2.5 - 3.0	5.70E-10 1.07E-09 1.64E-09	1.29E-09 1.36E-09 1.03E-09	8.27E-10 7.14E-10 9.52E-10 4.00E-10 3.94E-10	2.39E-10 4.66E-10 5.16E-10 4.94E-10 4.13E-10		10 m
TABLE 2.3-21	N PARAMI SS >500 HRS (meters ⁻² )		THE CONT 2.0 - 2.5	8.12E-10 1.33E-09 2.63E-09	2.31E-09 1.91E-09 1.47E-09	1.18E-09 1.02E-09 1.36E-09 5.70E-10 2.61E-10	5.44E-10 6.63E-10 7.35E-10 7.04E-10 5.86E-10		
Ţ	PV-1/2 DEPOSITION PARAMETERS ( <u>D/Q</u> ) FOR INUOUS RELEASES >500 HRS/YR OR >150 HR (meters ² )		DISTANCES TO T 1.5 1.5 - 2.0	1.76E-09 2.55E-09 3.62E-09	3.27E-09 3.12E-09 2.46E-09	1.97E-09 1.68E-09 2.10E-09 8.84E-10 8.71E-10	1.04E-09 1.03E-09 4.71E-10 1.18E-09 9.12E-10		
	PV-1/2 DEPOSITION PARAMETERS (D/Q) FOR CONTINUOUS RELEASES >500 HRS/YR OR >150 HRS/QTR (meters ² )		DIST 1.0 - 1.5	3.14E-09 1.98E-09 1.32E-09	3.69E-09 4.09E-09 4.40E-09	3.52E-09 3.01E-09 3.76E-09 7.83E-10 1.55E-09	1.36E-09 1.84E-09 3.09E-10 2.86E-10 1.63E-09		
	Û	• .	0.5 - 1.0	8.60E-09 5.64E-09 1.57E-09	1.55E-09 1.28E-08 7.85E-09	6.41E-09 4.66E-09 4.81E-09 2.89E-09 5.55E-09	6.63E-09 2.95E-09 4.13E-10 4.09E-10 2.05E-09		
			0.0 - 0.5	6.00E-10 6.66E-10 1.03E-09	1.13E-09 1.35E-09 9.82E-10	2.76E-09 2.22E-09 3.00E-09 1.44E-08 1.89E-08	1.57E-09 3.78E-10 4.54E-10 4.52E-10 3.40E-10		
			SECTOR	N NNE NE	ENE E ESE	SE SSE SSW SW	MSW WNW WNN		

	1	seaver	V 2	illey PC	ower Sta	uion		1/2-ODC-2.02
Title OD(	CM: GAS	EOUS EF	FLU	JENTS			Unit: <u>1/2</u> Revision: 2	Level Of Use: In-Field Reference Page Number:
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						e 2.of 7		.:
		CONTIN	IUO	US RELEA	ASE DEPOS	SITION PARAM	IETERS (0-5 M	1ILES)
			1	1				
		<i>•</i> .	- 5.0	2.38E-10 3.22E-10 4.66E-10	5.39E-10 3.32E-10 1.87E-10	2.09E-10 1.52E-10 1.96E-10 1.39E-10 1.93E-10	2.77E-10 3.15E-10 4.75E-10 6.41E-10 2.94E-10	
			4.5 -	3.22	5.39 3.32 1.87	2.09 1.52 1.96 1.39 1.93	2.77E-10 3.15E-10 4.75E-10 6.41E-10 2.94E-10	
		4 g 1 4 4	N I	000	000	90000	_	
			4.0 - 4.5	2.91E-10 3.94E-10 5.69E-10	6.58E-10 4.05E-10 2.28E-10	2.55E-10 1.85E-10 2.39E-10 1.70E-10 2.35E-10	3.38E-10 3.85E-10 5.79E-10 7.83E-10 3.59E-10	
		-	4	2.9 3.9 5.6	6.5 4.0 2.2	2.3	6. 6. 6. 6. 6. 8. 7. 9. 6. 7. 8. 6.	
			- 4.0	01-10	60 -1 0	-10 -10	10	
		ES	3.5 -	4.00E-10 4.92E-10 7.77E-10	1.01E-09 5.06E-10 3.14E-10	3.19E-10 2.32E-10 2.99E-10 2.34E-10 3.24E-10	4.55E-10 4.82E-10 8.96E-10 1.21E-09 4.84E-10	
	Ř	MIL						
	FOR S/QT	, IN	3.0 - 3.5	5.16E-10 6.35E-10 1.00E-09	1.31E-09 6.54E-10 4.05E-10	4.12E-10 2.99E-10 3.86E-10 3.02E-10 4.18E-10	5.87E-10 6.22E-10 1.16E-09 1.56E-09 6.25E-10	
		SNO	3.0	5.16 6.35 1.00	1.31 6.54 4.05	4.12 2.99 3.86 3.02 4.18	5.87 6.22 1.16 1.56 6.25	
	2150 >150	CATI	0	000	0	00000	00000	
	ETEI OR	roi	2.5 - 3.0	7.57E-10 8.54E-10 1.57E-09	1.76E-09 9.59E-10 5.94E-10	6.55E-10 4.42E-10 5.71E-10 4.06E-10 5.62E-10	8.45E-10 8.36E-10 1.55E-09 2.10E-09 9.00E-10	
5	AMI S/YR	ROL	5	7.5 8.5 1.5	1.7 9.5 5.9	6.5 5.7 5.7 5.6 5.6	8.8 8.3 1.5 2.1 9.0	
ABLE 2.3-22	PAR HRS Ins ⁻² )	THE CONTROL LOCATIONS, IN MILES	2.5	နို နို နို	60- 60- 1-	-10 -10 -10	စို စို စို စို စို	
ILE :	(TION PAF 5 >500 HR (meters ² )	E C	2.0 - 2.5	1.08E-09 1.22E-09 2.24E-09	2.50E-09 1.37E-09 8.46E-10	9.32E-10 6.29E-10 8.14E-10 5.78E-10 8.01E-10	1.20E-09 1.19E-09 2.21E-09 2.99E-09 1.28E-09	
TAE	) SES :	-						·
	<b>JEP(</b>	es To	1.5 - 2.0	1.81E-09 1.89E-09 3.47E-09	3.64E-09 2.12E-09 1.42E-09	1.45E-09 1.15E-09 1.26E-09 8.97E-10 1.47E-09	1.87E-09 2.64E-09 3.60E-09 4.86E-09 2.12E-09	
	V-21	NCI	1.5	1.81 1.89 1.89 3.47	3.64 2.12 1.42	1.45 1.15 1.26 8.97 1.47	1.87 2.64 3.60 4.86 2.12	
	DONS	DISTANCES TO	S	666	6 6 6	8 6 6 6 6	88888	
	CV-1 AND CV-2 DEPOSITION PARAMETERS (D/Q) FOR ONTINUOUS RELEASES >500 HRS/YR OR >150 HRS/QT (meters ² )	D	1.0 - 1.5	3.24E-09 3.37E-09 6.21E-09	6.51E-09 3.79E-09 2.54E-09	2.59E-09 2.06E-09 2.26E-09 1.60E-09 2.62E-09	3.34E-09 4.72E-09 6.43E-09 8.68E-09 3.79E-09	
	CV-1 AND CV-2 DEPOSITION PARAMETERS (D/Q) FOR CONTINUOUS RELEASES >500 HRS/YR OR >150 HRS/QTR (meters ² )			8133	3.5	5.6 1.6	6 4 9 8 6 6 7 9 9 C	
	0		1.0	66 69	-08 -08 -09	60-60- 60-60-	00-08 00-08 00-08 00-09 00-00-00-00-00-00-00-00-00-00-00-00-00-	
	^		0.5 - 1.0	7.73E-09 9.39E-09 1.27E-08	1.35E-08 1.05E-08 5.60E-09	5.70E-09 4.92E-09 6.37E-09 4.52E-09 5.30E-09	7.97E-09 1.13E-08 1.60E-08 2.07E-08 9.04E-09	
		·		· · · ·				
			0.0 - 0.5	4.46E-08 5.42E-08 7.32E-08	7.77E-08 6.08E-08 3.23E-08	3.29E-08 2.84E-08 3.67E-08 3.61E-08 3.06E-08	4.60E-08 6.49E-08 9.25E-08 1.19E-07 5.22E-08	
			0.0	4.46 5.42 7.32	7.7. 6.08 3.23	3.29E-08 2.84E-08 3.67E-08 2.61E-08 3.06E-08	4.6( 6.45 9.25 1.19 5.22	
		ļ	)R					
			SECTOR	E	шш	ш <b>З</b> ,	WSW WNW NNW NNW	
			SE	N NNE NE	ENE E ESE	SE SSE SSW SSW	WSW WNW NWW NNW	

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### CONTINUOUS RELEASE DEPOSITION PARAMETERS (0-5 MILES)

### TABLE 2.3-23

### VV-1 AND VV-2 DEPOSITION PARAMETERS ( $\overline{D/Q}$ ) FOR CONTINUOUS RELEASES >500 HRS/YR OR >150 HRS/QTR (meters⁻²)

Same as Table 2.3-22

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#### ATTACHMENT K Page 4 of 7 CONTINUOUS RELEASE DEPOSITION PARAMETERS (0-5 MILES)

### TABLE 2.3-24

### TV-2 DEPOSITION PARAMETERS $(\overline{D/Q})$ FOR CONTINUOUS RELEASES >500 HRS/YR OR >150 HRS/QTR (meters⁻²)

Same as Table 2.3-22

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Beaver Valley Power Station	Procedure Nu	umber: 1/2-ODC-2.02
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### Page 5 of 7 CONTINUOUS RELEASE DEPOSITION PARAMETERS (0-5 MILES)

### TABLE 2.3-25

### CB-2 DEPOSITION PARAMETERS $(\overline{D/Q})$ FOR CONTINUOUS RELEASES >500 HRS/YR OR >150 HRS/QTR (meters⁻²)

Same as Table 2.3-22

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Jnit:	Level Of Use:	
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### Page 6 of 7 CONTINUOUS RELEASE DEPOSITION PARAMETERS (0-5 MILES)

### TABLE 2.3-26

### DV-2 DEPOSITION PARAMETERS $(\overline{D/Q})$ FOR CONTINUOUS RELEASES >500 HRS/YR OR >150 HRS/QTR (meters⁻²)

Same as Table 2.3-22

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Beaver Valley Power Station	Procedure Nu	mber: 1/2-ODC-2.02
Title:	Unit: 1/2	Level Of Use: In-Field Reference
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CONTINUOUS RELEASE DEPOSITION PARAMETI	ERS (0-5 M	IILES)
TABLE 2.3-27		· · ·

### WV-2 DEPOSITION PARAMETERS ( $\overline{D/Q}$ ) FOR CONTINUOUS RELEASES >500 HRS/YR OR >150 HRS/QTR (meters⁻²)

Same as Table 2.3-22

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Be	eaver Valley	tion	Pro	becedure Number: $1/2 - \dot{\Omega}$	DC-2.02	
Title:				Un		DC-2.02
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ODCM: GASE	OUS EFFLUENTS	5		Re	vision: Page 2	Number:
			HMENT L	<b>__</b>	4	<u>117 of 130</u>
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CONTI	NUOUS RELEAS	v		TERS (SPE	CIAL DISTA	NCES
	NUUUUS RELEAS	DEPOSITION			CIAL DISTR	INCES)
		TABL	E 2.3-28			
·	• • • •					
PV-	1/2 DEPOSTION		· •/			ASES
		OR >150 HRS/C				
	(IDEN I	IFIED IN ATTA		E TABLE 2.	2-3)	
-		(1E-9	meters ⁻² )			
		INDIVIDUA	L RECEPT	ORS		
DOWNWIND	SITE	VEGETABLE	MILK	MILK	MEAT	
SECTOR	BOUNDARY	GARDEN	COW	GOAT	ANIMAL	RESIDENCI
· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	······	<u> </u>			······································
N	.600	2.340		.572	.707	2.510
NNE	.673	3.220	'	.524	2.920	3.220
NE	.766	1.280	.660	.111	.660	1.200
ENE	1.010	5.080 .		.702		1.760
Е	1.370	4.420	.401	1.290	1.290	4.420
ESE	.984	6.390		2.340	6.390	6.180
SE	11.000	3.680	.466	.466	1.300	3.680
SSE	7.060	3.220	.423	.105	3.140	4.320
~02	1.000	01220				
S.	5.780	1.540	1.410		2.610	2.730
SSW	2.040	1.040	.578	.208	1.040	1.460
SW	1.610	1.120		.693	.979	1.120
WSW	1.710	1.310	.370		1.190	1.310
	1) 					
W	.377	.659	.138		.518	.659
WNW	.424	.746	.497	.029	.746	.746
NW	.447	.425		.070	.488	.422
NNW	.340	1.840		.043	.545	1.92
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Beaver Valley Power Station						Procedure Number: 1/2-ODC-2.02		
itle:					Unit:	Level Of Use:		
		<b>A</b>		- F	1/2 Revision: 1	In-Field Reference Page Number:		
DDCM: GASEC	US EFFLUENT	S		f - 1	2	118 of 130		
		ATTAC	HMENT L	_ ,_				
		•	e 2 of 7			, · · ·		
CONTIN	NUOUS RELEAS	SE DEPOSITION	V PARAME	TERS (SP	ECIAL DIS	TANCES)		
		TARI	LE 2.3-29			·		
		Indi	· · · · · · · · · · · · · · · · · · ·					
CV-1 AN	D CV-2 DEPOST	TION PARAME	FERS (D/Q)	FOR CON	NTINUOUS	S RELEASES		
	>500 HRS/YR	OR >150 HRS/0	QTR FOR S	PECIAL D	ISTANCE	S a s		
	(IDENT	IFIED IN ATTA		E TABLE :	2.2-3)			
		(1E-9	meters ⁻² )			۰		
-		INDIVIDUA	LRECEPT	ORS				
DOUNIUMD	CITE		······································					
DOWNWIND SECTOR	SITE BOUNDARY	VEGETABLE GARDEN	MILK COW	MILK GOAT	MEA ANIM			
······································				···································	······································	· · · ·		
N	25.40	2.05		.693	.847			
NNE	18.80	2.02		.459	1.850			
NE	63.40	29.30	.455	.078	.455			
ENE	65.90	8.92		.661	~~	32.20		
E	38.00	3.90	.382	1.020	1.020	22.70		
ESE	17.10	3.56		1.380	3.560			
SE	13.80	3.03	.350	.350	1.100			
SSE	10.50	2.65	.317	.094	2.570	3.68		
-			0.0 ·			· · · · · ·		
S	10.60	1.05	.934		1.860			
SSW	5.59	1.26	.663	.266	1.260			
SW	3.94	2.21	506	1.320				
WSW	27.50	2.65	.596		2.380	2.65		
W	31.60	1.23	.645		.960	1.23		
WNW	39.10	2.23	1.490	.045	2.230			
NW	70.60	15.00		.276	1.990			
NNW	31.50	6.52		.068	1.090	9.91		
			ĸ					
· · · · · · · · · · · · · · · · · · ·								

Beaver Valley Power Station	Procedure Number: 1/2-ODC-2.02		
Title:	Unit: 1/2	Level Of Use: In-Field Reference	
ODCM: GASEOUS EFFLUENTS	Revision: 2	Page Number: 119 of 130	
ATTACHMENT L			
Page 3 of 7			
CONTINUOUS RELEASE DEPOSITION PARAMETERS (	SPECIAL I	DISTANCES)	
<b>TABLE 2.3-30</b>			
VV-1 AND VV-2 DEPOSTION PARAMETERS (D/Q) FOR C	ONTINUO	US RELEASES	
>500 HRS/YR OR >150 HRS/QTR FOR SPECIA	L DISTANO	CES	
(IDENTIFIED IN ATTACHMENT E TABI	E 2.2-3)		
$(1E-9 \text{ meters}^{-2})$			
- Same as Table 2.3-29			
Same as Lable 2.3-27			

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Be	aver Valle	P	rocedure Number	DDC-2.02		
ìitle:			<u></u>	U	nit: Lev	el Of Use:
				Jul R		In-Field Reference
DDCM: GASEC	US EFFLUENI	S	· · · · · · · · · · · · · · · · · · ·	2 () () () () () () () () () () () () ()	2	120 of 130
			HMENT L		r.	
			4 of 7			line contras
CONTIN	NUOUS RELEA	SE DEPOSITION	N PARAME	TERS (SPE	CIAL DIST.	ANCES)
		TABL	E 2.3-31			
·			·		· ¥	
TV-		PARAMETERS				ASES
		COR >150 HRS/C				
	(IDEN)	FIFIED IN ATTA	CHMENII meters ⁻² )	E TABLE 2	.2-3)	
		(11)	meters j			
-		INDIVIDUA	L RECEPT	ORS		
DOWNWIND	SITE	VEGETABLE	MILK	MILK	MEAT	
SECTOR	BOUNDARY	GARDEN	COW	GOAT	ANIMAI	L RESIDENCE
Ν	20.20	2.05		.693	.847	2.190
NNE	34.90	2.02		.459	1.850	2.110
NE	54.20	29.30	.455	.078	.455	30.400
ENE	57.50	8.92		.661		32.200
E	38.10	3.90	.382	1.020	1.020	22.700
ESE	18.60	3.56		1.380	3.560	3.560
SE	19.00	3.03	.351	.351	1.100	3.030
SSE	13.30	2.65	.318	.094	2.570	3.690
0	11.20	10.40	024		1.000	1.050
S	11.30	10.40	.934		1.860	1.950
SSW SW	6.44 3.95	1.26 2.21	.664	.266 1.320	1.260 1.920	4.430 2.210
S W WSW	25.10	2.65	.597	1.520	2.380	2.650
W 5 W	25.10	2.05			2.380	2.050
W	28.40	1.23	.646		.961	1.230
WNW	30.90	2.23	1.490	.045	2.230	2.230
NW	56.10	14.90	-	.276	1.980	15.500
NNW	25.10	6.53		.068	1.100	9.920
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Beaver Valley Power Station	Procedure Nu	
Title:	Unit:	1/2-ODC-2.02 Level Of Use:
	1/2	In-Field Reference
ODCM: GASEOUS EFFLUENTS	Revision: 2	Page Number: 121 of 130
ATTACHMENT L Page 5 of 7 CONTINUOUS RELEASE DEPOSITION PARAMETERS (S	SPECIAL I	DISTANCES)
TABLE 2.3-32		
CB-2 DEPOSTION PARAMETERS (D/Q) FOR CONTIN >500 HRS/YR OR >150 HRS/QTR FOR SPECIAL (IDENTIFIED IN ATTACHMENT E TABL (1E-9 meters ⁻² )	DISTAN	
- Same as Table 2.3-31		
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Beaver Valley Power Station		Procedure Number: 1/2-ODC-2.02			
Title:	- • · · · · · · ·	Unit: 1/2	Level Of Use: In-Field Referen	nce	
ODCM: GASEOUS EFFLUENTS		Revision: 2	Page Number: 122 of 130		
ATTACHMENT L Page 6 of 7 CONTINUOUS RELEASE DEPOSITION PARAME	ETERS (SI	PECIAL D	ISTANCES)		
TABLE 2.3-33				· •	
DV-2 DEPOSTION PARAMETERS (D/Q) FOR >500 HRS/YR OR >150 HRS/QTR FOR S (IDENTIFIED IN ATTACHMENT (1E-9 meters ⁻² )	SPECIAL	DISTANC			
- Same as Table 2.3-2	29				
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	Beaver '	Valley P	ower Stati	ion	Procedure Nu	1/2-0DC-2	
Title: ODCM: Ga	ASEOUS EFF	LUENTS			Unit: 1/2 Revision: 2	Page Number	Reference
CC	ONTINUOUS	RELEASE D	ATTACH Page 7 DEPOSITION I		S (SPECIAL I	.,	
			TABLE	2.3-34	• •		
	, , >500 ]	HRS/YR OR (IDENTIFIE	>150 HRS/QT D IN ATTAC	D/Q) FOR CON TR FOR SPECI HMENT E TAI teters ⁻² )	AL DISTANC BLE 2.2-3)		
	-		Same as Ta	ble 2.3-29			
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	n stand Maria National Maria Maria Maria Maria		•				
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Beaver Valley Power Station						Procedure Number: 1/2-ODC-2.02			
Title:				t		Level Of Use:			
				L	1/2	In-Field Reference			
ODCM: GASE	OUS EFFLUENT	Ϋ́S		F	evision: 2	Page Number: 124 of 130			
	······································	ATTAC	HMENT M	······································	<u></u>				
		Page	elof3						
BA	TCH RELEASE	DISPERSION PA	ARAMETER	RS (SPECIA	AL DISTA	NCES)			
			· · · ·						
		TARI	LE 2.3-35						
		IADI	2.2-22	to pr		· .			
CV-1	AND CV-2 DISE	PERSION PARA	METERS (X	(/Q) FOR I	BATCH R	ELEASES			
		OR ≥150 HRS/0							
		TIFIED IN ATTA	•						
-	•		$ec/m^3$ )		,				
	-								
		INDIVIDUA	AL RECEPT	ORS		······			
DOWNWIND	SITE	VEGETABLE	MILK	MILK	MEA	T			
SECTOR*	BOUNDARY	GARDEN	COW	GOAT	ANIM	AL RESIDENCE			
N	8.21E-5	8.38E-6		3.72E-6	4.34E	-6 8.82E-6			
NNE	3.04E-5	4.71E-6		1.40E-6	4.38E	-6 4.87E-6			
NE	4.59E-5	2.21E-5	6.05E-7	1.38E-7	6.05E	-7 2.28E-5			
ENE	3.72E-5	5.25E-6 ·		5.66E-7		1.88E-5			
r. ¹	0.02F.C	2 705 (		1.1000 (	1 100				
E	2.93E-5	3.79E-6	5.15E-7	1.17E-6					
ESE SE	2.47E-5	5.61E-6	≟_ 0.1217.7	2.34E-6					
SE SSE	2.14E-5 2.21E-5	5.00E-6 6.31E-6	8.13E-7 1.11E-6	8.13E-7 3.92E-7					
SSE	2.21E-J	0.31E-0	1.11E-0	).72E-/	0.13E	-U 0.47E-0			
S	2.15E-5	3.03E-6	2.76E-6		4.93E-	-6 5.14E-6			
SSW	2.18E-5	6.58E-6	3.81E-6	1.82E-6		3			
	1.82E-5	1.03E-5		6.67E-6					
SW		1.29E-5	4.10E-6		1.19E	,			
SW WSW	1.09E-4					:			
WSW									
WSW W	1.49E-4	1.05E-5	6.55E-6		8.77E-				
WSW W WNW	1.49E-4 1.91E-4	1.05E-5 1.72E-5	6.55E-6 1.28E-5	 1.23E-6	1.72E-	-5 1.72E-5			
WSW W	1.49E-4	1.05E-5		1.23E-6 3.80E-6 1.35E-6	1.72E-	-5 1.72E-5 -5 6.36E-5			

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Period of Record: 1976 - 1980

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Bea	aver Valley	Power Sta	tion	Proc	edure Number: $1/2 \cap$	DC-2.02
Fitle:				Unit		Of Use:
					1/2 II	n-Field Reference
DDCM: GASEO	<b>JS EFFLUENTS</b>	S		Revi		Number:
	·			l	2	125 of 130
			HMENT M			
		•	2 of 3		DIGTANO	
BAI	CH RELEASE L	DISPERSION PA	RAMETER	S (SPECIAL	DISTANC	ES)
		TABL	E 2.3-36			
VV-1 A	ND VV-2 DISP	ERSION PARA	METERS (X	(/Q) FOR BA	ATCH RELE	EASES
		OR ≥150 HRS/0				•
		<b>IFIED IN ATTA</b>	•			
			$c/m^3$ )		,	
-		,	•			
		INDIVIDUA	L RECEPT	ORS		
DOWNWIND	SITE	VEGETABLE	MILK	MILK	MEAT	· . ·
	BOUNDARY	GARDEN	COW	GOAT	ANIMAL	RESIDENCI
N	9.75E-5	1.00E-5		4.21E-6	4.95E-6	1.06E-5
NNE	9.73E-3	5.11E-6		4.21E-0 1.43E-6	4.93E-6 4.72E-6	5.30E-6
NE	6.13E-5	2.70E-5	6.20E-7	1.43E-0 1.40E-7	4.72E-0 6.20E-7	2.81E-5
ENE	4.83E-5	5.58E-6	0.2012-7	5.71E-7	0.2012-7	2.81E-5 2.24E-5
EINE	4.03E-3	J.JOE-0		J./IE-/		2.241-3
Е	3.66E-5	3.99E-6	5.25E-7	1.19E-6	1.19E-6	2.10E-5
ESE	2.99E-5	6.13E-6		2.43E-6	6.13E-6	6.13E-6
SE	2.55E-5	5.29E-6	8.24E-7	8.24E-7	2.13E-6	5.29E-6
SSE	2.65E-5	6.72E-6	1.12E-6	3.95E-7	6.53E-6	9.22E-6
··· • •			· · · •		<b>-</b>	
S	2.52E-5	3.14E-6	2.83E-6		5.29E-6	5.53E-6
SSW	2.60E-5	7.34E-6	4.15E-6	1.92E-6	7.34E-6	2.09E-5
SW	2.13E-5	1:18E-5		7.41E-6	1.04E-5	1.18E-5
WSW	1.34E-4	1.51E-5	4.46E-6		1.38E-5	1.51E-5
·						
W		1.25E-5	7.40E-6		1.02E-5	1.25E-5
WNW	2.33E-4	·	1.49E-5	1.30E-6	2.07E-5	2.07E-5
line and -						
NW NNW	3.32E-4 1.90E-4	8.57E-5 4.69E-5	<del></del>	4.24E-6 1.45E-6	1.64E-5 1.09E-5	8.85E-5 6.75E-5

*Measured relevant to center point between BV-1 and BV-2 Containment Buildings

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Period of Record: 1976 - 1980

Beaver Valley Power Station					cedure Number: 1/2-0	ODC-2.02	
Fitle:				Uni	t: Le	vel Of Use:	٢
		a		Rev	1/2 ision: Pa	In-Field Reference ge Number:	<u> </u>
ODCM: GASEC	JUS EFFLUENI		2	126 of 130	(		
1			HMENT M			••	
·		•	e 3 of 3				
BAI	CH RELEASE I	DISPERSION PA	RAMETER	S (SPECIAI	L DISTAN	CES)	
		TABI	E 2.3-37				
- A				ODDATCI			
P		ION PARAMET OR ≥150 HRS/(	· · ·				
		TIFIED IN ATTA	-				
			$c/m^3$ )	/ 1710 L. 2.2			
		· ·					•
-		INDIVIDUA	L RECEPTO	ORS			
DOWNWIND	SITE	VEGETABLE	MILK	MILK	MEAT	• • • • • •	
SECTOR*	BOUNDARY	GARDEN	COW	GOAT	ANIMA	L RESIDENC	CE
Ν	3.09E-9	3.30E-6		1.13E-6	1.34E-6	3.36E-6	
NNE	2.85E-9	2.68E-6		6.52E-7	2.47E-6		
NE	2.02E-10	7.42E-9	5.44E-7	1.24E-7	5.44E-7	5.51E-9	
ENE	1.02E-9	3.21E-6		6.29E-7	'	1.67E-9	
E	2.15E-9	2.91E-6	4.96E-7	1.14E-6	1.14E-6	2.91E-6	
ĒSE	6.90E-9	4.97E-6		1.95E-6	4.97E-6		*
SE	2.91E-6	3.52E-6	6.02E-7	6.02E-7	1.43E-6		- (
SSE	4.91E-6	3.56E-6	6.53E-7	2.18E-7	3.47E-6		
S	2 415 4	1 705 6	1 (55) (		0.04T (		
S T SSW	2.41E-6	1.78E-6 2.52E-6	1.65E-6		2.84E-6		
	4.83E-6		1.50E-6	6.60E-7	2.52E-6		
CIU	4.82E-6	2.75E-6	8.79E-7	1.78E-6			
SW	5 770 7		X / YH_/	,	2.57E-6	2.81E-6	
SW WSW	5.77E-7	2.81E-6	0.771-7				
	5.77E-7 2.88E-9	2.81E-6 1.68E-6	4.89E-7	<b></b>	1.37E-6	1.68E-6	:
WSW			4.89E-7	 1.10E-7			•
WSW W	2.88E-9	1.68E-6	4.89E-7 1.13E-6		1.61E-6	4 <b>1.61E-6</b>	•

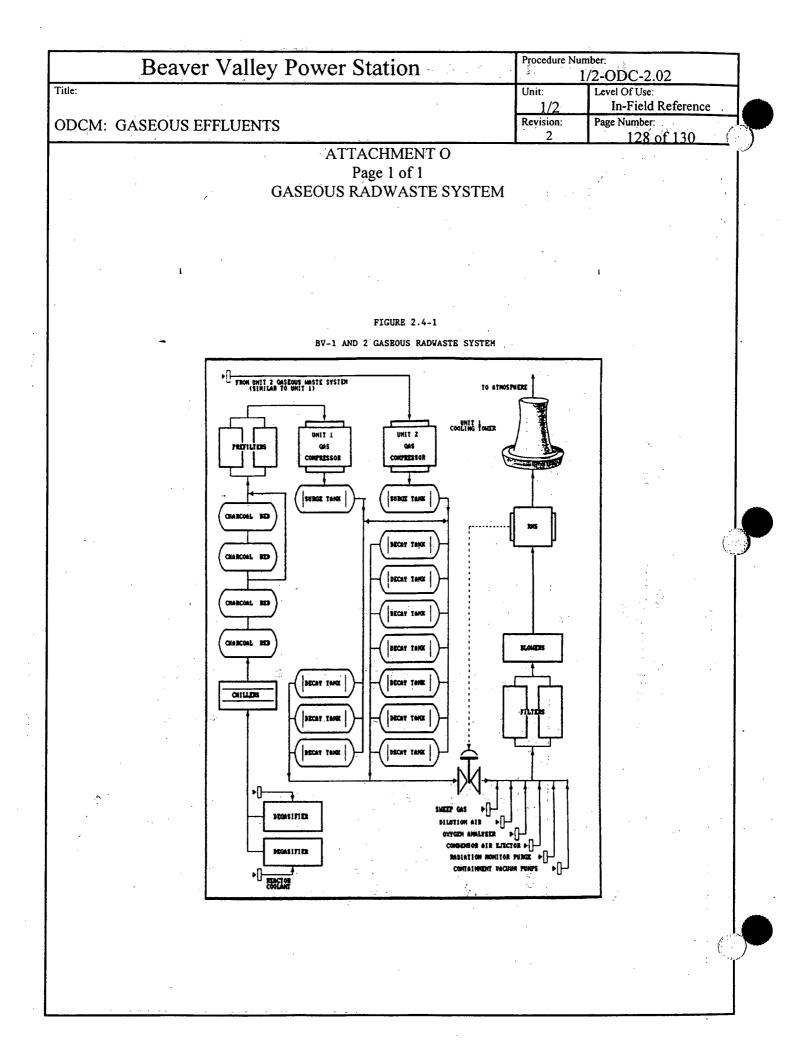
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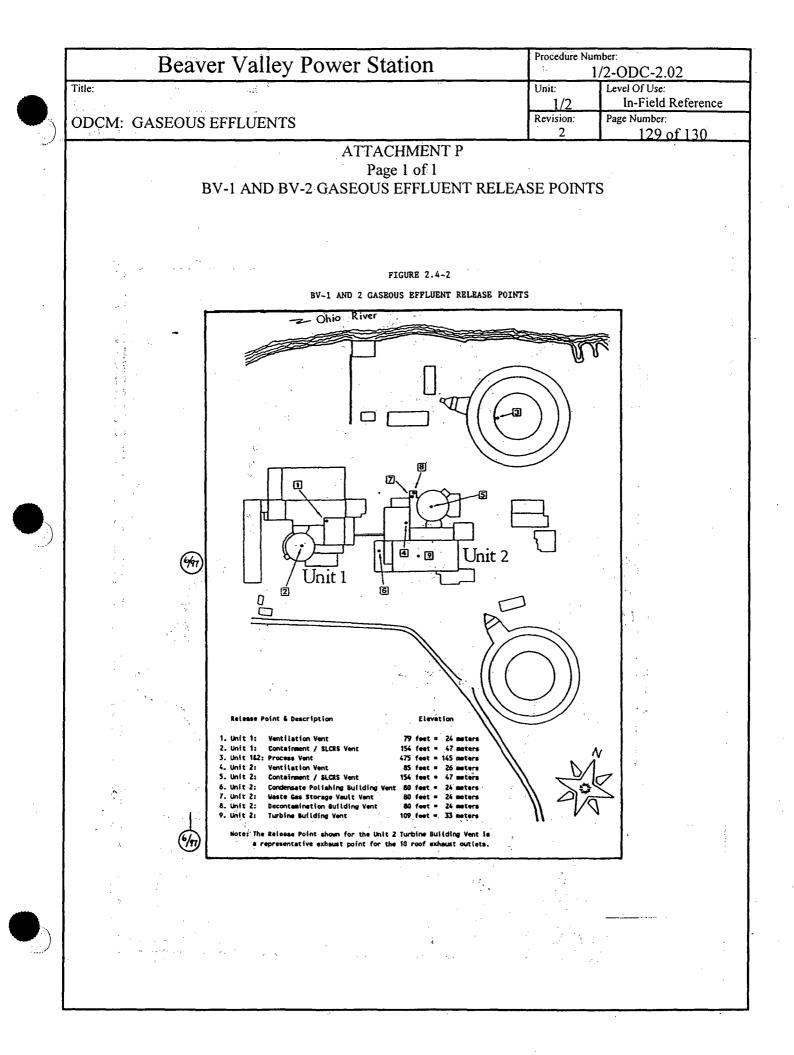
Period of Record: 1976 - 1980

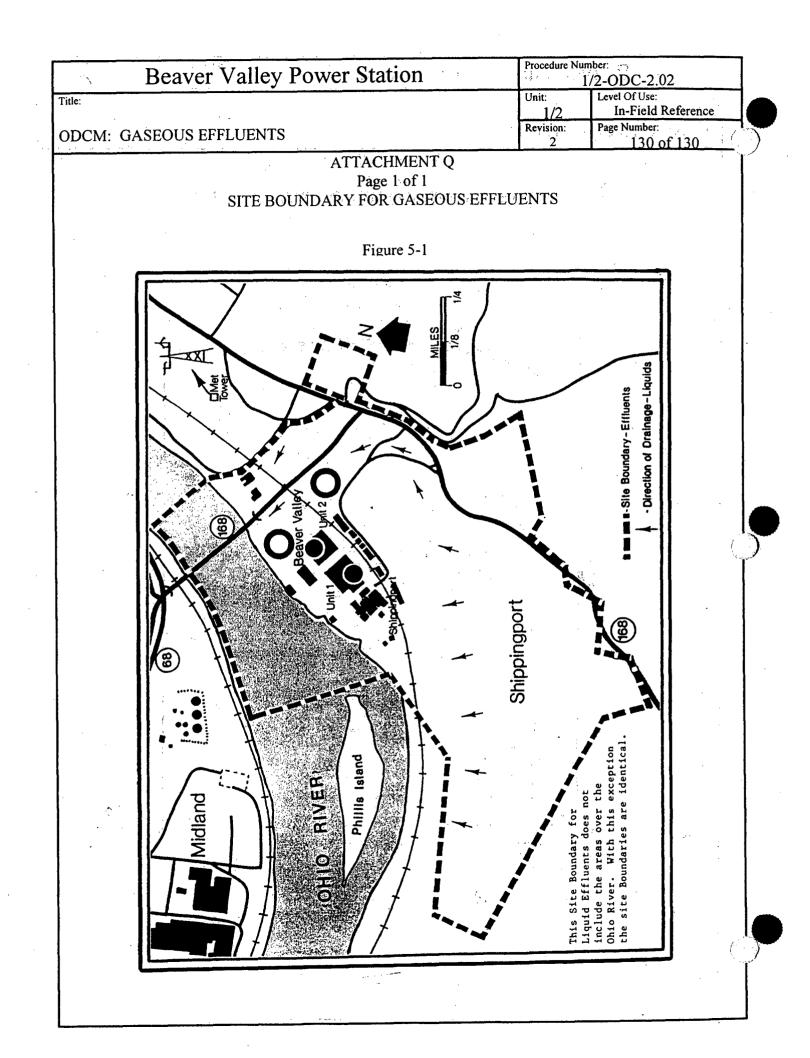
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Title								Uni	t: 1/2		2-ODC-2.02 Level Of Use: In-Field Referen	ice			
OD	CM: GASI	EOUS EF	FLU	IENTS	,						Rev	ision: 2		Page Number: 127 of 130	
		BAT	CH F	RELEASE		Pag	CHME e 1 of ON PA	1		ΓERS	(0 -	5 MI	LES		
			4.5 - 5.0	5.06E-7 4.81E-7 5.32E-7 3 82E-7		4.82E-7 3.83E-7	3.68E-7 3.32E-7	4.00E-7	4.77E-7 5.85E-7	5.07E-7		5.48E-7 4.89E-7	4.60E-7	7-200.4	
TABLE 2.3-38		AILES	4.0 - 4.5	5.93E-7 5.64E-7 7.34E-7 6.06E-7		5.11E-7 4.37E-7	4.32E-7 3.95E-7	4.74E-7	5.62E-7 6.89E-7	5.99E-7		5.80E-7 5.28E-7	5.42E-7	1-31 6.6	
	¥		3.5 - 4.0	7.13E-7 6.51E-7 6.76E-7 7 23F-7		6.92E-7 5.76E-7	5.74E-7 5.24E-7	6.24E-7	6.31E-7 7.17E-7	7.52E-7	ţ	7.68E-7 4.61E-7	6.12E-7	0.48E-1	
	PV-1/2 DISPERSION PARAMETERS (D/Q) FOR CONTINUOUS RELEASES ≥500 HRS/YR OR ≥150 HRS/QTR (sec/m³)	THE CONTROL LOCATIONS, IN MILES	3.0 - 3.5	8.84E-7 8.05E-7 9.28E-7 9.25E-7		8.74E-7 -6.70E-7	~ 7.14E-7 6.55E-7	7.75E-7	7.83E-7 8.19E-7	9.06E-7		4.86E-7 7.75E-7	8.09E-7	0.00	
	IETERS (D∕i ts/YR OR ≥	ROL LOCA	2.5 - 3.0	1.13E-6 1.13E-6 1.19E-6 1.13E-6		1.12E-6 9.93E-7	9.58E-7 9.42E-7	1.17E-6	1.08E-6 1.11E-6	1.01E-6		1.25E-6 1.17E-6	1.08E-6	0-100.1	
TABLE 2.3-38	ON PARAM ES ≥500 HF (sec/m³)		2.0 - 2.5	1.51E-6 1.36E-6 1.72E-6 1.66E-6		1.44E-6 1.34E-6	1.31E-6 1.29E-6	1.59E-6	1.48E-6 1.25E-6	1.46E-6		1.69E-6 1.59E-6	1.46E-6		
F	PV-1/2 DISPERSI INUOUS RELEAS	DISTANCES TO	1.5 - 2.0	2.61E-6 2.19E-6 2.28E-6 2.21E-6		2.23E-6 2.04E-6	1.99E-6 1.95E-6	2.34E-6	2.18E-6 2.19E-6	2.29E-6	t. Tasa	2.49E-6 1.92E-6	2.24E-6	0-9017	
	ionnilnoc		1:0 - 1.5	4.10E-6 2.83E-6 7.39E-8 2.60E-6		2.77E-6 3.48E-6	3.38E-6 3.33E-6	3.97E-6	2.84E-6 3.47E-6	3.16E-6		4.21E-6 5.66E-8	8.37E-8	0-10000	
		•	0.5 - 1.0	1.07E-5 5.39E-6 1.67E-8 8 87E-8	) 	5.10E-6 5.26E-6	3.13E-6 4.86E-6	4.12E-6	6.22E-6 9.11E-6	9.35E-6		4.52E-6 1.44E-8	1.98E-8	0-01	
		1 	0.0 0.5	2.75E-15 5.90E-17 4.45E-16 1.92E-15		1.84E-15 2.96E-13	9.16E-8 3.50E-8	1.22E-7	1.75E-5 2.08E-5	8.56E-8		5.44E-17 9.25E-18	2.61E-16		
		•	SECTOR	N NNE NE ENE		E ESE	SE SSE	S	SW	WSW		w wnw	NW	\$	







### **Unit 1/2**

#### 1/2-ODC-2.03

#### **ODCM:** Radiological Environmental Monitoring Program

Document Owner Manager, Nuclear Environmental and Chemistry

Revision Number	1
Level Of Use	General Skill Reference
Safety Related Procedure	Yes

	Properties N						
Beaver Valley Power Station	Procedure N	Procedure Number: 1/2-ODC-2.03					
Title: ODCM: Radiological Environmental Monitoring Program	Unit: 1/2	Level Of Use: General Skill Reference					
	Revision:	Page Number:					
		<u>2 of 23</u>					
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2.0 SCOPE							
3.0 REFERENCES AND COMMITMENTS	••••••						
3.1 References	•••••						
3.3 Commitments	•••••••						
4.0 RECORDS AND FORMS	•••••••						
4.1 Records	•••••						
4.2 Forms							
5.0 PRECAUTIONS AND LIMITATIONS							
6.0 ACCEPTANCE CRITERIA							
7.0 PREREQUISITES							
8.0 PROCEDURE							
8.1 REMP Overview							
8.2 Sampling and Analysis Program	•••••	5					
8.3 Crosscheck Program	•••••						
8.4 Land Use Census Program							
8.5 Direct Radiation Monitoring Program							
ATTACHMENT A EXPOSURE PATHW							
ATTACHMENT B	LOCATION	OF SAMPLING SITES					

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Beaver Valley Power Station	Procedure N	umber: 1/2-ODC-2.03
ule: DCM: Radiological Environmental Monitoring Program	Unit: 1/2	Level Of Use: General Skill Reference
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# 1.0 <u>PURPOSE</u>

- 1.1 This procedure provides the Radiological Environmental Monitoring Program (REMP) requirements from the Radiological Branch Technical Position.^(3.1.1)
  - 1.1.1 Prior to issuance of this procedure, these items were located in Section 3 of the old ODCM.

# 2.0 <u>SCOPE</u>

2.1 This procedure is applicable to all station personnel that are qualified to perform activities as described and referenced in this procedure.

# 3.0 <u>REFERENCES AND COMMITMENTS</u>

# 3.1 **<u>References</u>**

- 3.1.1 Radiological Branch Technical Position, Revision 1, 1979.
- 3.1.2 Regulatory Guide 1.109, Calculation of Annual Dose to Man From Routine Releases of Reactor Effluents For the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I, Revision 1, 1977.
- 3.1.3 NUREG-1301, Offsite Dose Calculation Manual Guidance; Standard Radiological Effluent Controls for Pressurized Water Reactors (Generic Letter 89-01, Supplement No. 1).
- 3.1.4 Regulatory Guide 1.111, Methods For Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases From Light-Water-Cooled Reactors, Revision 1, July 1977.
- 3.1.5 1/2-ADM-1640, Control of the Offsite Dose Calculation Manual
- 3.1.6 1/2-ADM-0100, Procedure Writers Guide
- 3.1.7 1/2-ADM-0101, Review and Approval of Documents
- 3.1.8 CR04-00149, Radiation Protection Performance Committee Actions Items. CA-12 required obtaining GPS satellite data for use in the REMP.
- 3.1.9 CR05-01169, Chemistry Action Plan for transition of RETS, REMP and ODCM. CA-17, revise procedure 1/2-ODC-2.03 to convert Radiation Protection responsibilities to Nuclear Environmental and Chemistry.
- 3.1.10 CR05-01390, Include GPS data in 2004 REMP Report and related 1/2-ODC and 1/2-ENV procedures. CA-02, revise ODCM procedure 1/2-ODC-2.03 to include an update of REMP sample locations (using the GPS Satellite data).

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# 3.2 **Commitments**

3.2.1 10 CFR 50 Appendix I

# 4.0 <u>RECORDS AND FORMS</u>

#### 4.1 <u>Records</u>

4.1.1 Any calculation supporting ODCM changes shall be documented, as appropriate, by a retrievable document (e.g., letter or calculation package) with an appropriate RTL number.

# 4.2 **Forms**

4.2.1 None.

# 5.0 PRECAUTIONS AND LIMITATIONS

5.1 The specified detection capabilities are state-of-the-art for routine environmental measurements in industrial laboratories.

# 6.0 ACCEPTANCE CRITERIA

- 6.1 Any change to this procedure shall contain sufficient justification that the change will maintain the level of radioactive effluent control required by 10 CFR 20.1302,
  40 CFR Part 190, 10 CFR 50.36a and Appendix I to 10 CFR 50, and not adversely impact the accuracy or reliability of effluent dose or setpoint calculation.
  - 6.1.1 All changes to this procedure shall be prepared in accordance with 1/2-ADM-0100^(3.1.6) and 1/2-ADM-1640^(3.1.5).
  - 6.1.2 All changes to this procedure shall be reviewed and approved in accordance with 1/2-ADM-0101^(3.1.7) and 1/2-ADM-1640^(3.1.5).

# 7.0 **PREREQUISITES**

7.1 The user of this procedure shall be familiar with ODCM structure and format.

# 8.0 <u>PROCEDURE</u>

# 8.1 **REMP Overview**

8.1.1 Attachment A, Table 3.0-1 contains the site number, sector, distance, sample point description, sampling and collection frequency, analysis, and analysis frequency for various exposure pathways in the vicinity of the Beaver Valley Power Station for the REMP. Attachment B, Figures 3.0-1 through 3.0-6 show the location of the various sampling points.

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# 8.2 Sampling and Analysis Program

- 8.2.1 Environmental samples shall be collected and analyzed according to Attachment A, Table 3.0-1. Analytical techniques used shall be such that the detection capabilities in 1/2-ODC-3.03, Table 4.12-1 are achieved.
- 8.2.2 The results of the radiological environmental monitoring are intended to supplement the results of the radiological effluent monitoring by verifying that the measurable concentrations of radioactive materials and levels of radiation are not higher than expected on the basis of the effluent measurements and modeling of the environmental exposure pathways.
  - 8.2.2.1 The specified environmental monitoring program provides measurements of radiation and of radioactive materials in those exposure pathways and for those radionuclides which lead to the highest potential radiation exposures of individuals resulting from the station operation.
  - 8.2.2.2 The initial radiological environmental monitoring program should be conducted for the first 3 years of commercial operation (or other period corresponding to a maximum burnup in the initial core cycle). Following this period, program changes may be proposed based on operational experience.
- 8.2.3 Deviations are permitted from the required sampling schedule if specimens are unobtainable due to hazardous conditions, seasonal unavailability, malfunction of automatic sampling equipment and other legitimate reasons.
  - 8.2.3.1 <u>IF</u> specimens are unobtainable due to sampling equipment malfunction, <u>THEN</u> every effort shall be made to complete corrective action prior to the end of the next sampling period.
  - 8.2.3.2 All deviations from the sampling schedule shall be documented in the annual REMP report.

# 8.3 Crosscheck Program

8.3.1 The laboratories of the licensee and licensee's contractors which perform analyses shall participate in the Environmental Protection Agency's (EPA's) Environmental Radioactivity Laboratory Intercomparisons Studies (Crosscheck) Program or equivalent program.

8.3.1.1 This participation shall include all of the determinations (sample mediumradionuclide combination) that are offered by EPA and that also are included in the monitoring program.

	Be	aver Valley Power Station	Procedure N	umber: 1/2-ODC-2.03	
itte: DDCM: Ra		gical Environmental Monitoring Program	Unit: <u>1/2</u> Revision: 1	1/2-ODC-2.03 Level Of Use: General Skill Referer Page Number: 6 of 23	ice .
8.3.1	1.2	The results of analysis of these crosscheck samples s REMP report. The participants in the crosscheck pro program code so that the NRC can review the partici submission in the annual REMP report.	ogram may	provide their	
8.3.1	1.3	<u>IF</u> the results of a determination in the crosscheck pr specified control limits, <u>THEN</u> the laboratory shall in problem and take steps to correct it. The results of the action shall be included in the annual REMP report.	nvestigate	the cause of the	
8.3.2	inde _j mate	requirement for the participation in the crosscheck propendent checks on the precision and accuracy of the minimum rial in environmental sample matrices as part of the quironmental monitoring in order to demonstrate the resu	easuremenuality assu	nts of radioactive rance program for	
8.4 <u>La</u>	nd Us	e Census Program			
0.4.1	A ce	nsus shall be conducted annually during the growing s	season to d	etermine the	
8.4.1 8.4.1	locat (500 with	<ul> <li>nsus shall be conducted annually during the growing stion of the nearest milk animal, and nearest garden gre sq. ft.) producing broad leaf vegetation in each of the in a distance of 8 km (5 miles).</li> <li>For elevated releases as defined in Regulatory Guide also identify the locations of <u>all</u> milk animals, and ga meters producing broad leaf vegetation out to a dista radial sector.</li> </ul>	ater than 5 16 meteor 1.111 ^{(3.1.4} ardens grea	⁽⁾ , the census shall ater than 50 square	
	locat (500 with	<ul> <li>ion of the nearest milk animal, and nearest garden gre sq. ft.) producing broad leaf vegetation in each of the in a distance of 8 km (5 miles).</li> <li>For elevated releases as defined in Regulatory Guide also identify the locations of <u>all</u> milk animals, and gameters producing broad leaf vegetation out to a distance of a distance of also a distance of a</li></ul>	ater than 5 16 meteor 1.111 ^{(3.1.4} ardens grea nce of 5 kr s or garder er than tho cation used ed to the D RC Region	^{b)} , the census shall ater than 50 square m (3 miles) for each as are present at a bse previously d in ODCM dose Director of Operating	
8.4.1	locat (500 with	<ul> <li>ion of the nearest milk animal, and nearest garden gre sq. ft.) producing broad leaf vegetation in each of the in a distance of 8 km (5 miles).</li> <li>For elevated releases as defined in Regulatory Guide also identify the locations of <u>all</u> milk animals, and ga meters producing broad leaf vegetation out to a dista radial sector.</li> <li><u>IF</u> it is learned from this census that the milk animals location which yields a calculated thyroid dose great sampled, or if the census results in changes in the loc calculations, <u>THEN</u> a written report shall be submitte Reactors, NRR (with a copy to the Director of the NI days identifying the new location (distance and direct sample).</li> </ul>	ater than 5 16 meteor 1.111 ^{(3.1.4} ardens grea nce of 5 kr s or garder er than tho cation used ed to the D RC Region tion).	<ul> <li>i) square meters cological sectors</li> <li>i), the census shall ater than 50 square m (3 miles) for each ms are present at a ose previously in ODCM dose Director of Operating thal Office) within 30</li> <li>c) shall be shall be</li> </ul>	
8.4.1 8.4.1	locat (500 with 1.1 1.2	<ul> <li>ion of the nearest milk animal, and nearest garden gre sq. ft.) producing broad leaf vegetation in each of the in a distance of 8 km (5 miles).</li> <li>For elevated releases as defined in Regulatory Guide also identify the locations of <u>all</u> milk animals, and ga meters producing broad leaf vegetation out to a dista radial sector.</li> <li><u>IF</u> it is learned from this census that the milk animals location which yields a calculated thyroid dose great sampled, or if the census results in changes in the loc calculations, <u>THEN</u> a written report shall be submitt Reactors, NRR (with a copy to the Director of the NI days identifying the new location (distance and direct 1).</li> </ul>	ater than 5 16 meteor 1.111 ^{(3.1.4} ardens grea nce of 5 ki s or garder er than tho cation used ed to the E RC Region tion). gher calcu practicable. e location) illance pro sus was con may be dro	<ul> <li>i) square meters ological sectors</li> <li>i), the census shall ater than 50 square m (3 miles) for each m (3 miles) for each as are present at a ose previously in ODCM dose Director of Operating hal Office) within 30</li> <li>llated doses shall be having the lowest gram at the end of nducted. Any opped from the</li> </ul>	

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- 8.4.1.5 The census of milk animals and gardens producing broad leaf vegetation is based on the requirement in Appendix I of 10 CFR Part 50^(3.2.1) to "Identify changes in the use of unrestricted areas (e.g., for agricultural purposes) to permit modifications in monitoring programs for evaluating doses to individuals from principal pathways of exposure." The consumption of milk from animals grazing on contaminated pasture and of leafy vegetation contaminated by airborne radioiodine is a major potential source of exposure. Samples from milk animals are considered a better indicator of radioiodine in the environment than vegetation.
  - 8.4.1.5.1 <u>IF</u> the census reveals milk animals are not present or are unavailable for sampling, <u>THEN</u> vegetation must be sampled.
- 8.4.1.6 The 50 square meter garden, considering 20% used for growing broad leaf vegetation (i.e., similar to lettuce and cabbage), and a vegetation yield of 2 kg/m², will produce the 26 kg/yr assumed in Regulatory Guide 1.109^(3.1.2), for child consumption of leafy vegetation.

# 8.5 Direct Radiation Monitoring Program

8.5.1 The increase in the number of direct radiation stations is to better characterize the individual exposure (mrem) and population exposure (man-rem) in accordance with Criterion 64 - monitoring radioactivity releases, of 10 CFR Part 50, Appendix A. The NRC will place a similar amount of stations in the area between the two rings designated in 1/2-ODC-3.03, Table 3.12-1.

- END -

	Be	aver Valley Pow	er Station		e Number: <u>1/2-ODC-2.03</u>	
Title: ODCM:	Radiolog	gical Environmental Mor	itoring Program	Unit: 1/2 Revision	: Page Number:	
		• •	ATTACHMENT A Page 1 of 4 AY AND SAMPLING REQU	I 1 JIREMI	ENTS	23
	<u>TYPE AND</u> <u>FREQUENCY OF</u> <u>ANALYSES</u>	Radioiodine Cartridge: I-131 analysis weekly. Particulate Sampler: Gross beta analysis following filter change ⁵ ; Gamma isotopic analysis on composite (by location)	Gamma dose quarterly.		•	
·	SAMPLING AND COLLECTION FREQUENCY	Continuous sampler operation with collection at least weekly	Continuous measurement with quarterly collection. 8	· · · · · · · · · · · · · · · · · · ·		
TABLE 3.0-1 PROGRAM DETAILS	SAMPLE POINT DESCRIPTION ³	Old Meyer Farm Shippingport (Cook's Ferry S.S.) Midland (North S.S.) Industry, McKeel's Service - Rt. 68 Weirton Water Tower, Collier Way	Shippingport Post Office Old Meyer Farm Hookstown Boro Georgetown Post Office Brunton Farm Sherman Farm Friendship Ridge Shippingport (Cook's Ferry S.S.) Midland (North S.S.) Christian House Baptist Chapel - Rt. 18 Racoon Twp., Kennedy's Corner	Industry, Midway Drive Industry - McKeel's Service - Rt. 68 East Liverpool Water Dept.	wenton water Iower, Colliter way Aliquippa (Sheffield S.S.) 236 Green Hill Rd. 444 Hill Rd. 236 Engle Rd. Brighton Twp., First Western Bank	•
	SECTOR ¹ MILES ²	1.49 0.43 0.75 2.28 16.40	0.94 1.49 2.53 3.75 6.14 8.60 7.97 0.43 0.75 0.75	2.28 4.88 4.88	10.40 8.00 2.51 3.36 6.01	
	SECTOR	11 4 15 2/3 10	3/4 11 12 15 15 15 15 12 12 12 12 12 12 12 12 12 12 12 12 12	2/3 14	0 1 1 3 6 6 7 0	
	<u>AND/OR SITE</u> <u>NO.</u>	13 30 46.1 48.1	10 13 13 23 23 24 29 23 23 23 23 23 23 24 23 24 25 24 25 24 25 24 25 26 25 27 25 26 26 26 27 27 26 27 26 27 26 27 26 27 26 27 26 27 26 27 27 26 27 27 26 27 27 27 27 27 27 27 27 27 27 27 27 27	40 46.1 47	48 59 60 71 71	
	EXPOSURE PATHWAY AND SAMPLE	AIRBORNE Radioiodine and Particulates	2. DIRECT RADIATION			

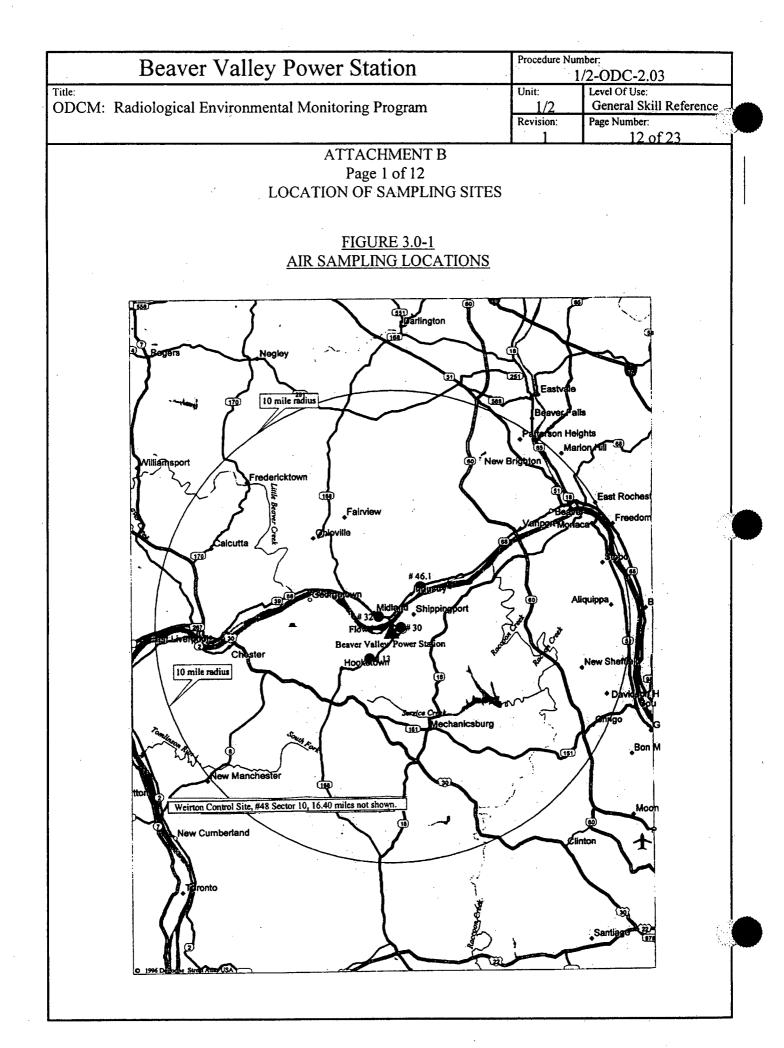
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	CM: Radiological Environmental Monitoring Program							R	1/ evision	4			ge Ni	imbe	r:																
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·	ENCY	ly.																							-						
	PE AND FREQUENCY ANALYSES	Gamma dose quarterly																•				·				·		·			
<u>UND</u>	X IO		nt with																												
SAMPLING AND	COLLECTION FREQUENCY	Continuous	measurement with	quarterly	collection.					, .								S								,					
TABLE 3.0-1 <u>PROGRAM DETAILS</u>	SAMPLE POINT DESCRIPTION ³	Ohioview Luthern Church - Rear	618 Squirrel Run Road	137 Poplar Ave CCBC	117 Holt Road	Raccoon Elementary School		Raccoon Municipal Building	Auto Body	Raccoon Park Office, Rt. 18		2697 Rt. 18	735 Mill Creek Road		2048 Rt. 30	1090 Ohio Ave., E. Liverpool	50103 Calcutta Smith's Ferry Rd.	110 Summit Rd., Midland Heights	488 Smith Ferry Rd., Ohioville	6286 Tuscarawras Rd.	Pine Grove & Doyle Roads	Georgetown Rd. (Georgetown	104 Linden - Sunrise Hills	832 McCleary Road	McCleary Road & Pole Cat	Hollow Rd.					
	MILES ²	3.25	2.48	6.92	4.08	3.80	5.52	2.72	0 t.	8.27	3.69	6.99	4.26	8.35	5.73	6.18	7.04	2.74	4.72	5.20	3.89	2.81	1.10	2.25	2.37					•	
	E SECTOR ¹ MILES ²	Ω.	4					r °	•	6	6	6	10	-	12	13			15	1	7	12	16		10						·
	AND/OR SITE NO.		73	74	75	16	<i>LL</i>	78	6	80	81	82	83	84	85	86	87	88	89	06	91	92	93	94	95						
EXPOSURE	PATHWAY AN SAMPLE	2. DIRECT RADIATION	(continued)																												

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	Be	eaver Val	ley Power S	tati	on		Proced	lure Nu 1	mber: 1/2-ODC-	.2.03
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1		EXPOSUR	Pa E PATHWAY Al	age 3 ND S		NG REQU	JIREN	1EN7	ſS	
	TYPE AND FREQUENCY OF ANALYSES	Gamma isotopic analysis monthly; tritium analysis on composite (by location) quarterly.	I-131 analysis bi-weekly; gamma isotopic analysis on composite (by location) monthly; tritium analysis on composite (by location) quarterly.		Gamma isotopic analysis semi-annually.	Gamma isotopic and I-131 analysis on each sample.	, ,	Gamma isotopic analysis.	Oli edible politoli.	Annually at harvest Gamma isotopic and I-131 time. analysis on edible portion.
	SAMPLING AND COLLECTION FREQUENCY	Composite sample with sample collection at least monthly ⁶ .	Composite sample with sample collection at least bi-weekly ⁶ .		Semi-annually.	At least bi-weekly when animals are on pasture; at least	monthly at other times.	Semi-annually	oue sourpre of available species.	Annually at harvest time.
TABLE 3.0-1 (continued) PROGRAM DETAILS	SAMPLE POINT DESCRIPTION ³	Upstream of Montgomery Dam ⁴ Midland – ATI Allegheny Ludlam	Midland Water Dept. East Liverpool Water Dept.	None required ⁷	BVPS Outfall Vicinity	Searight Farm	Windsheimer Farm	BVPS Outfall Vicinity	Upstream of Montgomery Dam	Three (3) locations within 5 miles of BVPS (Shippingport, Industry, and Georgetown) ⁸ One (1) control location (Weirton, W. Va. area) ⁹
	SECTOR ¹ MILES ²	4.92 1.43	1.26 4.90		0.31	2.10	 10.48	0.31	4.92	
	<u>SECTOR¹</u>	14 3	15 14		12	<u>0</u>	10	12	, C	<b>I I I I</b>
	SITE NO.	49 2.1	4 v		2A	25 * * 8 * 8	** 96	2A	49	1 1 1 1
	<u>EXPOSURE</u> PATHWAY AND/OR SAMPLE	3. WATERBORNE a) Surface (River)	b) Drinking Water	c) Ground Water	d) Shoreline Sediment	4. INGESTION a) Milk		b) Fish		c) Food Products (Leafy Vegetables)

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EXPOSURE PATHW	ATTACHMENT A Page 4 of 4 /AY AND SAMPLING RE	QUIREMEN	
TABLE 3.0-1 (continued)         PROGRAM DETAILS         PROGRAM DETAILS       SAMPLNOR       SITE       SECTOR ¹ MILES ² SAMPL E POINT       SAMPLNOR       OF AND FREQUENCY         PATHWAY AND/OR       SITE       SECTOR ¹ MILES ² SAMPL E POINT       SAMPLNOR       OF AND FREQUENCY         PATHWAY AND/OR       NO.       SECTOR ¹ MILES ² SAMPL E POINT       SAMPLNOR       OF AND FREQUENCY         SAMPLE       NO.       NO.       SAMPLNOR       OF AND FREQUENCY       OF ANALYSES         Plotation       I       Control Station and to the 16 compass direction sectors N - NNW.       OF ANALYSES       I ¹ Sector numbers 1-16 correspond to the 16 compass direction sectors N - NNW.       2       OILECTION       OF ANALYSES ² Distance (in miles) is as measured from the midpoint between Unit 1 and Unit 2 Containment Buildings.       A       I ³ All Sample Points are in the Commonwealth of Pennsylvania and the states of Ohio and West Virginia. Maps showing the approximate locations of the Sample Points are provided as Attachment B, Figures 3.0-1 through 3.0-6 and Attachment C.       A ⁴ This is a Control Station and is presumed to be outside the influence of BVPS effluents.       A       A	⁵ A gamma isotopic analysis is to be performed on each sample when the gross beta activity is found to be greater than 10 times the mean of the Control Station sample. ⁶ Composite samples are obtained by collecting an aliquot at intervals not exceeding 2 hours. For the upstream surface water location site 49, a weekly grab sample, composited each month is also acceptable. ⁷ Collection of Ground Water samples is not required as the hydraulic gradient or recharge properties are directed toward the river because of the high terrain in the river valley at the BVPS; thus, station effluents do not affect local wells and ground water sources in the area.	⁹ Exact location may vary due to availability of food products.	



Beaver Valley	Power Station
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ODCM: Radiological Environmental Monitoring Program

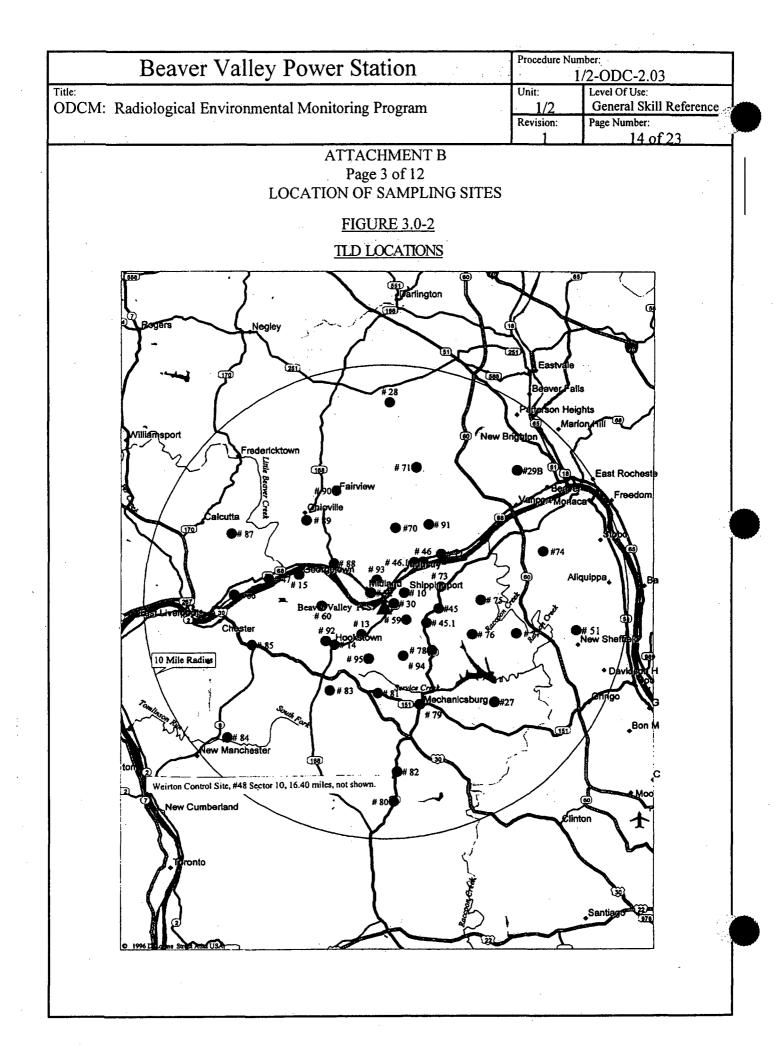
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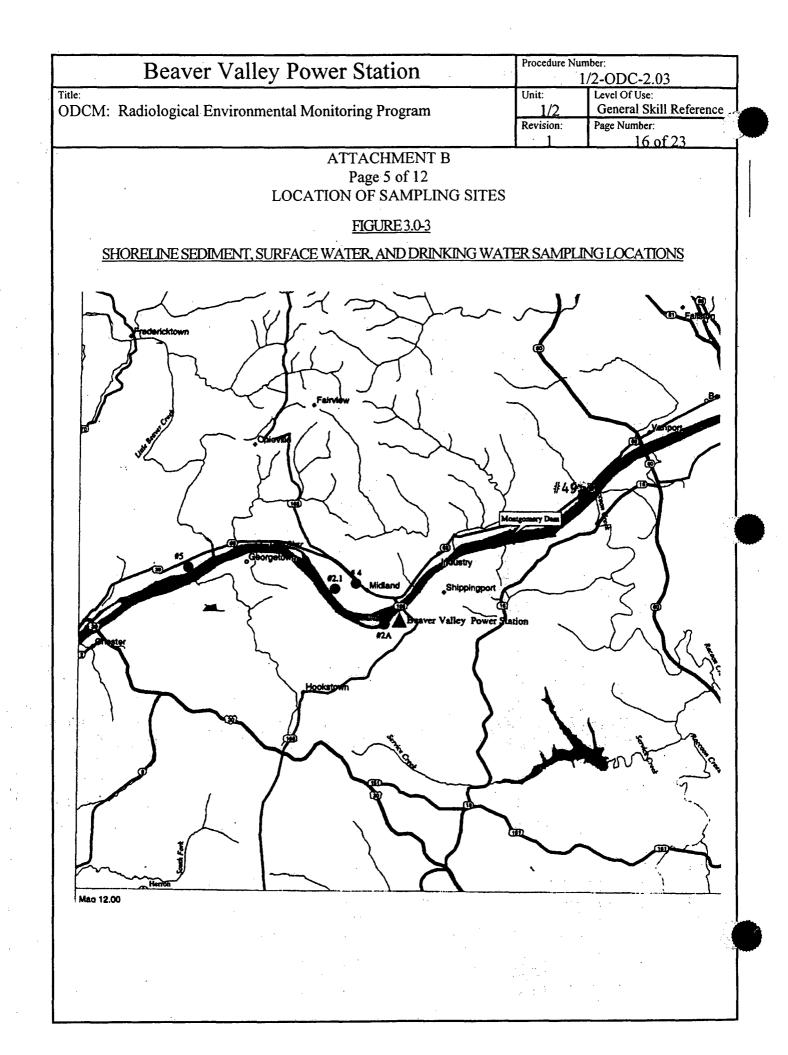
# ATTACHMENT B Page 2 of 12 LOCATION OF SAMPLING SITES

# FIGURE 3.0-1 (Continued) AIR SAMPLING LOCATIONS

Sector	Site #	Distance (miles)	Location
11	13	1.49	Old Meyer Farm
4	30 . :	0.43	Shippingport (Cook's Ferry S.S.)
-15	32	0.75	Midland (North S.S.)
2/3	46.1	2.28	Industry - McKeel's Service - Rt. 68
10	48	16.40	Weirton Water Tower, Collier Way



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			LOCATION OF	SA	MPLI	NG SI	TES				
			FIGURE 3.	0-2	<u>2 (cont</u>	inued)					
			TLD LO	C		NS					
			<u> </u>								
			So	uth	least						
Sector	Site #	Distance	Location		Sector	Site #	Distance	Location			
1		(miles)					(miles)				
7	27	6.14	Brunton Farm		7	78	2.72	Raccoon Municipal Bldg.			
6	45.1	1.92	Raccoon Twp., Kennedy Corners		8	79	4.46	106 Rt. 151- Ted McWilliams Aut			
			· · · · · · · · · · · · · · · · · · ·					Body			
5	51	8.00	Aliquippa (Sheffield S.S.)		. 9	80	8.27	Raccoon Park Office, Rt. 18			
6	59	0.99	236 Green Hill Road		9	82	6.99	2697 Rt. 18			
.6	76	3.80	Raccoon Elementary School	激烈	8	94	2.25	McCleary & Pole Cat Hollow Roa			
6	77	5.52	3614 Green Garden Road		1992 - 1992 - 199 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -	和影響					
<u> </u>					west	<u></u>					
Sector	Site #	Distance (miles)	Location		Sector		Distance (miles)	Location			
14	15	3.75	Georgetown Post Office		14	87	7.04	50103 Calcutta Smith's Ferry Rd.			
15	32	0.75	Midland (North S.S.)		15	88	2.74				
15 14	32 47	0.75 4.88	E. Liverpool Water Dept.		15	89	2.74 4.72	488 Smith Ferry Rd., Ohioville			
14 13	47 60	4.88 2.51	E. Liverpool Water Dept. 444 Hill Road		15 16	89 90	4.72 5.20	488 Smith Ferry Rd., Ohioville 6286 Tuscarawras Rd.			
14	47	4.88	E. Liverpool Water Dept.		15	89	4.72	488 Smith Ferry Rd., Ohioville			
14 13	47 60	4.88 2.51	E. Liverpool Water Dept. 444 Hill Road 1090 Ohio Avenue, E. Liverpool		15 16 16	89 90	4.72 5.20	488 Smith Ferry Rd., Ohioville 6286 Tuscarawras Rd.			
14 13	47 60	4.88 2.51	E. Liverpool Water Dept. 444 Hill Road 1090 Ohio Avenue, E. Liverpool		15 16	89 90	4.72 5.20	488 Smith Ferry Rd., Ohioville 6286 Tuscarawras Rd.			
14 13	47 60 86	4.88 2.51	E. Liverpool Water Dept. 444 Hill Road 1090 Ohio Avenue, E. Liverpool No	rth	15 16 16	89 90 93	4.72 5.20	488 Smith Ferry Rd., Ohioville 6286 Tuscarawras Rd. 104 Linden - Sunrise Hills			
14 13 13	47 60 86	4.88 2.51 6.18	E. Liverpool Water Dept. 444 Hill Road 1090 Ohio Avenue, E. Liverpool No	rth	15 16 16 neast	89 90 93	4.72 5.20 1.10	488 Smith Ferry Rd., Ohioville 6286 Tuscarawras Rd. 104 Linden - Sunrise Hills			
14 13 13	47 60 86	4.88 2.51 6.18 Distance	E. Liverpool Water Dept. 444 Hill Road 1090 Ohio Avenue, E. Liverpool No	rth	15 16 16 neast	89 90 93	4.72 5.20 1.10 Distance	488 Smith Ferry Rd., Ohioville 6286 Tuscarawras Rd. 104 Linden - Sunrise Hills			
14 13 13 Sector	47 60 86 Site #	4.88 2.51 6.18 Distance (miles)	E. Liverpool Water Dept. 444 Hill Road 1090 Ohio Avenue, E. Liverpool No Location	rth	15 16 16 neast	89 90 93 Site #	4.72 5.20 1.10 Distance (miles)	488 Smith Ferry Rd., Ohioville 6286 Tuscarawras Rd. 104 Linden - Sunrise Hills Location 236 Engle Rd.			
14 13 13 Sector	47 60 86 Site #	4.88 2.51 6.18 Distance (miles) 0.94	E. Liverpool Water Dept. 444 Hill Road 1090 Ohio Avenue, E. Liverpool No Location Shippingport Post Office	rth	15 16 16 neast Sector	89 90 93 Site # 70	4.72 5.20 1.10 Distance (miles) 3.36	488 Smith Ferry Rd., Ohioville 6286 Tuscarawras Rd. 104 Linden - Sunrise Hills Location 236 Engle Rd.			
14 13 13 Sector 3/4 1	47 60 86 Site # 10 28	4.88 2.51 6.18 Distance (miles) 0.94 8.60	E. Liverpool Water Dept. 444 Hill Road 1090 Ohio Avenue, E. Liverpool No Location Shippingport Post Office Sherman Farm	rth	15 16 16 neast Sector 1 2	89 90 93 Site # 70 71	4.72 5.20 1.10 Distance (miles) 3.36 6.01	488 Smith Ferry Rd., Ohioville 6286 Tuscarawras Rd. 104 Linden - Sunrise Hills Location 236 Engle Rd. Brighton Twp., First Western Ban			
14 13 13 Sector 3/4 1 3	47 60 86 Site # 10 28 29B	4.88 2.51 6.18 Distance (miles) 0.94 8.60 7.97	E. Liverpool Water Dept. 444 Hill Road 1090 Ohio Avenue, E. Liverpool No Location Shippingport Post Office Sherman Farm Friendship Ridge	rth	15 16 16 neast Sector 1 2 3	89 90 93 Site # 70 71 72	4.72 5.20 1.10 Distance (miles) 3.36 6.01 3.25	488 Smith Ferry Rd., Ohioville 6286 Tuscarawras Rd. 104 Linden - Sunrise Hills Location 236 Engle Rd. Brighton Twp., First Western Ban Ohioview Luthern Church - Rear			
14 13 13 Sector 3/4 1 3 4	47 60 86 Site # 10 28 29B 30	4.88 2.51 6.18 Distance (miles) 0.94 8.60 7.97 .0.43	E. Liverpool Water Dept. 444 Hill Road 1090 Ohio Avenue, E. Liverpool No Location Shippingport Post Office Sherman Farm Friendship Ridge Shippingport (Cook's Ferry S.S.)	rth	15 16 16 16 Neast Sector 1 2 3 4	89 90 93 Site # 70 71 72 73	4.72 5.20 1.10 <b>Distance</b> (miles) 3.36 6.01 3.25 2.48	488 Smith Ferry Rd., Ohioville 6286 Tuscarawras Rd. 104 Linden - Sunrise Hills Location 236 Engle Rd. Brighton Twp., First Western Ban Ohioview Luthern Church - Rear 618 Squirrel Run Rd.			
14 13 13 Sector 3/4 1 3 4	47 60 86 Site # 10 28 29B 30	4.88 2.51 6.18 Distance (miles) 0.94 8.60 7.97 .0.43	E. Liverpool Water Dept. 444 Hill Road 1090 Ohio Avenue, E. Liverpool No Location Shippingport Post Office Sherman Farm Friendship Ridge Shippingport (Cook's Ferry S.S.) Christian House Baptist Chapel - Rt 18	rth	15 16 16 16 Neast Sector 1 2 3 4	89 90 93 Site # 70 71 72 73	4.72 5.20 1.10 <b>Distance</b> (miles) 3.36 6.01 3.25 2.48	488 Smith Ferry Rd., Ohioville 6286 Tuscarawras Rd. 104 Linden - Sunrise Hills Location 236 Engle Rd. Brighton Twp., First Western Ban Ohioview Luthern Church - Rear 618 Squirrel Run Rd.			
14 13 13 Sector 3/4 1 3 4 5	47 60 86 Site # 10 28 29B 30 45	4.88 2.51 6.18 Distance (miles) 0.94 8.60 7.97 .0.43 2.19	E. Liverpool Water Dept. 444 Hill Road 1090 Ohio Avenue, E. Liverpool No Location Shippingport Post Office Sherman Farm Friendship Ridge Shippingport (Cook's Ferry S.S.) Christian House Baptist	rth	15 16 16 Neast Sector 1 2 3 4 4	89         90         93           93         Site #         70         71           70         71         72         73           74         74         74         74	4.72 5.20 1.10 <b>Distance</b> (miles) 3.36 6.01 3.25 2.48 6.92	488 Smith Ferry Rd., Ohioville 6286 Tuscarawras Rd. 104 Linden - Sunrise Hills Location 236 Engle Rd. Brighton Twp., First Western Ban Ohioview Luthern Church - Rear 618 Squirrel Run Rd. 137 Poplar Ave CCBC			
14 13 13 Sector 3/4 1 3 4 5 3	47 60 86 Site # 10 28 29B 30 45 46	4.88 2.51 6.18 Distance (miles) 0.94 8.60 7.97 0.43 2.19 2.49	E. Liverpool Water Dept. 444 Hill Road 1090 Ohio Avenue, E. Liverpool No Location Shippingport Post Office Sherman Farm Friendship Ridge Shippingport (Cook's Ferry S.S.) Christian House Baptist Chapel - Rt 18 Industry, Midway Dr.	rth	15 16 16 16 reast Sector 1 2 3 4 4 4 5	89         90           93         93           Site #         70           71         72           73         74           75         5	4.72 5.20 1.10 Distance (miles) 3.36 6.01 3.25 2.48 6.92 4.08	6286 Tuscarawras Rd. 104 Linden - Sunrise Hills Location 236 Engle Rd. Brighton Twp., First Western Ban Ohioview Luthern Church - Rear 618 Squirrel Run Rd. 137 Poplar Ave CCBC 117 Holt Rd.			
14 13 13 Sector 3/4 1 3 4 5 3	47 60 86 Site # 10 28 29B 30 45 46	4.88 2.51 6.18 Distance (miles) 0.94 8.60 7.97 0.43 2.19 2.49	E. Liverpool Water Dept. 444 Hill Road 1090 Ohio Avenue, E. Liverpool No Location Shippingport Post Office Sherman Farm Friendship Ridge Shippingport (Cook's Ferry S.S.) Christian House Baptist Chapel - Rt 18 Industry, Midway Dr. Industry – McKeel's Service – Rt 68	rth	15 16 16 16 Neast Sector 1 2 3 4 4 4 5 2	89         90           93         93           Site #         70           71         72           73         74           75         5	4.72 5.20 1.10 Distance (miles) 3.36 6.01 3.25 2.48 6.92 4.08	488 Smith Ferry Rd., Ohioville 6286 Tuscarawras Rd. 104 Linden - Sunrise Hills Location 236 Engle Rd. Brighton Twp., First Western Ban Ohioview Luthern Church - Rear 618 Squirrel Run Rd. 137 Poplar Ave CCBC 117 Holt Rd.			
14 13 13 Sector 3/4 1 3 4 5 3	47 60 86 Site # 10 28 29B 30 45 46	4.88 2.51 6.18 Distance (miles) 0.94 8.60 7.97 .0.43 2.19 2.49 2.28	E. Liverpool Water Dept. 444 Hill Road 1090 Ohio Avenue, E. Liverpool No Location Shippingport Post Office Sherman Farm Friendship Ridge Shippingport (Cook's Ferry S.S.) Christian House Baptist Chapel - Rt 18 Industry, Midway Dr. Industry – McKeel's Service – Rt 68	rth	15 16 16 16 reast Sector 1 2 3 4 4 4 5	89         90           93         93           Site #         70           71         72           73         74           75         5	4.72 5.20 1.10 Distance (miles) 3.36 6.01 3.25 2.48 6.92 4.08	488 Smith Ferry Rd., Ohioville 6286 Tuscarawras Rd. 104 Linden - Sunrise Hills Location 236 Engle Rd. Brighton Twp., First Western Ban Ohioview Luthern Church - Rear 618 Squirrel Run Rd. 137 Poplar Ave CCBC 117 Holt Rd.			
14 13 13 Sector 3/4 1 3 4 5 3 2/3	47 60 86 Site # 10 28 29B 30 45 46 46.1	4.88 2.51 6.18 Distance (miles) 0.94 8.60 7.97 .0.43 2.19 2.49 2.28	E. Liverpool Water Dept. 444 Hill Road 1090 Ohio Avenue, E. Liverpool No Location Shippingport Post Office Sherman Farm Friendship Ridge Shippingport (Cook's Ferry S.S.) Christian House Baptist Chapel - Rt 18 Industry, Midway Dr. Industry – McKeel's Service – Rt 68	rth	15 16 16 16 Neast Sector 1 2 3 4 4 4 5 2 west	89         90         93           93         Site #         70         71           72         73         74           75         91         91	4.72 5.20 1.10 Distance (miles) 3.36 6.01 3.25 2.48 6.92 4.08	488 Smith Ferry Rd., Ohioville 6286 Tuscarawras Rd. 104 Linden - Sunrise Hills Location 236 Engle Rd. Brighton Twp., First Western Ban Ohioview Luthern Church - Rear 618 Squirrel Run Rd. 137 Poplar Ave CCBC 117 Holt Rd.			
14 13 13 Sector 3/4 1 3 4 5 3 2/3	47 60 86 Site # 10 28 29B 30 45 46 46.1	4.88 2.51 6.18 Distance (miles) 0.94 8.60 7.97 0.43 2.19 2.49 2.28	E. Liverpool Water Dept. 444 Hill Road 1090 Ohio Avenue, E. Liverpool No Location Shippingport Post Office Sherman Farm Friendship Ridge Shippingport (Cook's Ferry S.S.) Christian House Baptist Chapel - Rt 18 Industry, Midway Dr. Industry – McKeel's Service – Rt 68 Sou	rth	15 16 16 16 Sector 1 2 3 4 4 4 5 2 west	89         90         93           93         Site #         70         71           72         73         74           75         91         91	4.72 5.20 1.10 Distance (miles) 3.36 6.01 3.25 2.48 6.92 4.08 3.89	488 Smith Ferry Rd., Ohioville 6286 Tuscarawras Rd. 104 Linden - Sunrise Hills Location 236 Engle Rd. Brighton Twp., First Western Ban Ohioview Luthern Church - Rear 618 Squirrel Run Rd. 137 Poplar Ave CCBC 117 Holt Rd. Pine Grove Rd. & Doyle Rd.			
14 13 13 Sector 3/4 1 3 4 5 3 2/3	47 60 86 Site # 10 28 29B 30 45 46 46.1	4.88 2.51 6.18 Distance (miles) 0.94 8.60 7.97 0.43 2.19 2.28 2.28 Distance (miles)	E. Liverpool Water Dept. 444 Hill Road 1090 Ohio Avenue, E. Liverpool No Location Shippingport Post Office Sherman Farm Friendship Ridge Shippingport (Cook's Ferry S.S.) Christian House Baptist Chapel - Rt 18 Industry, Midway Dr. Industry – McKeel's Service – Rt 68 Sou Location	rth	15 16 16 16 Sector 1 2 3 4 4 4 5 2 west	89         90         93           93         Site #         70         71           72         73         74           75         91         91	4.72 5.20 1.10 Distance (miles) 3.36 6.01 3.25 2.48 6.92 4.08 3.89 Distance (miles)	488 Smith Ferry Rd., Ohioville 6286 Tuscarawras Rd. 104 Linden - Sunrise Hills Location 236 Engle Rd. Brighton Twp., First Western Ban Ohioview Luthern Church - Rear 618 Squirrel Run Rd. 137 Poplar Ave CCBC 117 Holt Rd. Pine Grove Rd. & Doyle Rd. Location			
14 13 13 Sector 3/4 1 3 4 5 3 2/3 Sector 11	47 60 86 Site # 10 28 29B 30 45 46 46.1 Site # 13	4.88 2.51 6.18 Distance (miles) 0.94 8.60 7.97 0.43 2.19 2.28 Distance (miles) 1.49	E. Liverpool Water Dept. 444 Hill Road 1090 Ohio Avenue, E. Liverpool No Location Shippingport Post Office Sherman Farm Friendship Ridge Shippingport (Cook's Ferry S.S.) Christian House Baptist Chapel - Rt 18 Industry, Midway Dr. Industry – McKeel's Service – Rt 68 Sou Location Old Meyer Farm	rth	15           16           16           16           sector           1           2           3           4           5           2           west           Sector           11	89         90         93           93         Site #         70         71           72         73         74         75         91           Site #         84         84         84	4.72 5.20 1.10 <b>Distance</b> (miles) 3.36 6.01 3.25 2.48 6.92 4.08 3.89 <b>Distance</b> (miles) 8.35	488 Smith Ferry Rd., Ohioville 6286 Tuscarawras Rd. 104 Linden - Sunrise Hills Location 236 Engle Rd. Brighton Twp., First Western Ban Ohioview Luthern Church - Rear 618 Squirrel Run Rd. 137 Poplar Ave CCBC 117 Holt Rd. Pine Grove Rd. & Doyle Rd. Location Hancock Co. Senior Center			
14         13         13         Sector         3/4         1         3         2/3         Sector         11         11	47 60 86 Site # 10 28 29B 30 45 46 46.1 Site # 13 14	4.88 2.51 6.18 Distance (miles) 0.94 8.60 7.97 0.43 2.19 2.28 2.28 Distance (miles) 1.49 2.53	E. Liverpool Water Dept. 444 Hill Road 1090 Ohio Avenue, E. Liverpool No Location Shippingport Post Office Sherman Farm Friendship Ridge Shippingport (Cook's Ferry S.S.) Christian House Baptist Chapel - Rt 18 Industry, Midway Dr. Industry – McKeel's Service – Rt 68 Sou Location Old Meyer Farm Hookstown Boro	rth	15           16           16           16           sector           1           2           3           4           5           2           west           Sector           11           12	89         90         93           93         Site #         70           70         71         72           73         74         75           91         Site #         84           85         Site #         85	4.72 5.20 1.10 <b>Distance</b> (miles) 3.36 6.01 3.25 2.48 6.92 4.08 3.89 <b>Distance</b> (miles) 8.35 5.73	488 Smith Ferry Rd., Ohioville 6286 Tuscarawras Rd. 104 Linden - Sunrise Hills Location 236 Engle Rd. Brighton Twp., First Western Ban Ohioview Luthern Church - Rear 618 Squirrel Run Rd. 137 Poplar Ave CCBC 117 Holt Rd. Pine Grove Rd. & Doyle Rd. Location Hancock Co. Senior Center 2048 Rt. 30			
14 13 13 Sector 3/4 1 3 4 5 3 2/3 Sector 11	47 60 86 Site # 10 28 29B 30 45 46 46.1 Site # 13	4.88 2.51 6.18 Distance (miles) 0.94 8.60 7.97 0.43 2.19 2.28 Distance (miles) 1.49	E. Liverpool Water Dept. 444 Hill Road 1090 Ohio Avenue, E. Liverpool No Location Shippingport Post Office Sherman Farm Friendship Ridge Shippingport (Cook's Ferry S.S.) Christian House Baptist Chapel - Rt 18 Industry, Midway Dr. Industry – McKeel's Service – Rt 68 Sou Location Old Meyer Farm Hookstown Boro Weirton Water Tower, Collier	rth	15           16           16           16           sector           1           2           3           4           5           2           west           Sector           11	89         90         93           93         Site #         70         71           72         73         74         75         91           Site #         84         84         84	4.72 5.20 1.10 <b>Distance</b> (miles) 3.36 6.01 3.25 2.48 6.92 4.08 3.89 <b>Distance</b> (miles) 8.35	488 Smith Ferry Rd., Ohioville 6286 Tuscarawras Rd. 104 Linden - Sunrise Hills Location 236 Engle Rd. Brighton Twp., First Western Ban Ohioview Luthern Church - Rear 618 Squirrel Run Rd. 137 Poplar Ave CCBC 117 Holt Rd. Pine Grove Rd. & Doyle Rd. Location Hancock Co. Senior Center 2048 Rt. 30			
14         13         13         Sector         3/4         1         3         2/3         Sector         11         11	47 60 86 Site # 10 28 29B 30 45 46 46.1 Site # 13 14	4.88 2.51 6.18 Distance (miles) 0.94 8.60 7.97 0.43 2.19 2.28 2.28 Distance (miles) 1.49 2.53	E. Liverpool Water Dept. 444 Hill Road 1090 Ohio Avenue, E. Liverpool No Location Shippingport Post Office Sherman Farm Friendship Ridge Shippingport (Cook's Ferry S.S.) Christian House Baptist Chapel - Rt 18 Industry, Midway Dr. Industry – McKeel's Service – Rt 68 Sou Location Old Meyer Farm Hookstown Boro	rth	15           16           16           16           sector           1           2           3           4           5           2           west           Sector           11           12	89         90         93           93         Site #         70           70         71         72           73         74         75           91         Site #         84           85         Site #         85	4.72 5.20 1.10 <b>Distance</b> (miles) 3.36 6.01 3.25 2.48 6.92 4.08 3.89 <b>Distance</b> (miles) 8.35 5.73	488 Smith Ferry Rd., Ohioville 6286 Tuscarawras Rd. 104 Linden - Sunrise Hills Location 236 Engle Rd. Brighton Twp., First Western Ban Ohioview Luthern Church - Rear 618 Squirrel Run Rd. 137 Poplar Ave CCBC 117 Holt Rd. Pine Grove Rd. & Doyle Rd. Location Hancock Co. Senior Center			



ODCM: Radiological Environmental Monitoring Program

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# ATTACHMENT B Page 6 of 12 LOCATION OF SAMPLING SITES

#### FIGURE 3.0-3 (Continued)

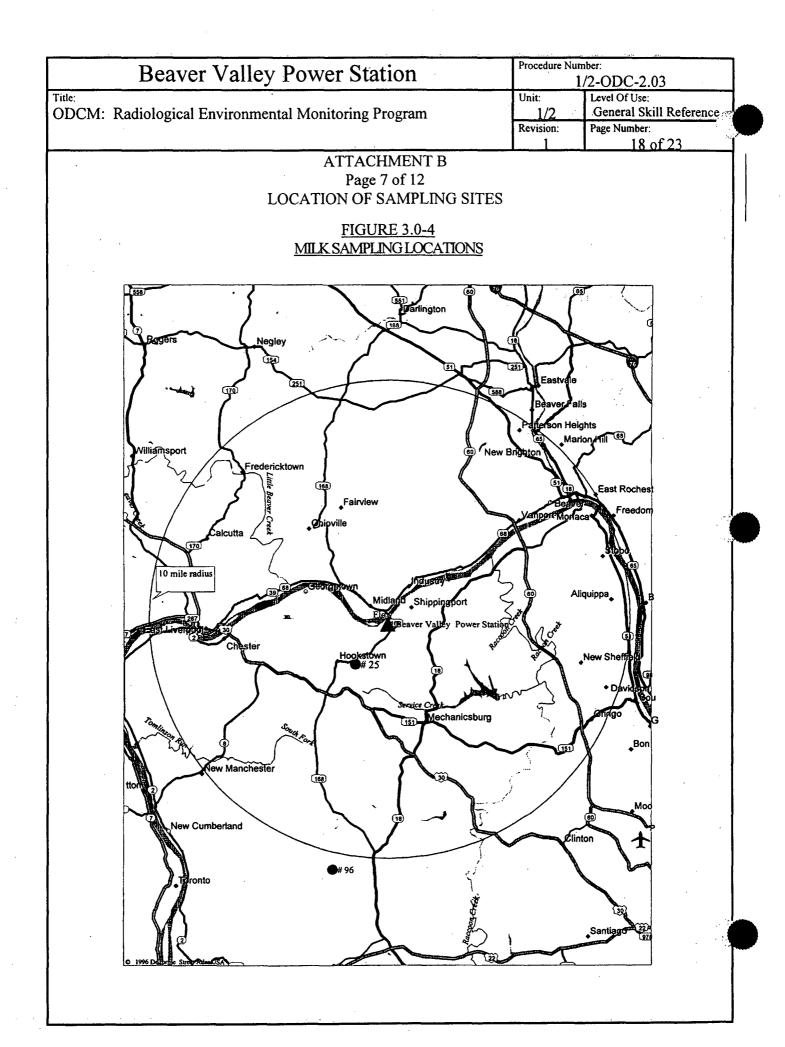
#### SHORELINE SEDIMENT, SURFACE WATER, AND DRINKING WATER SAMPLING LOCATIONS

Sample Type	Sector	Site #	Distance (miles)	Location
Surface Water	14	2.1	1.43	Midland - ATI Allegheny Ludlam
Surface Water	3	49	4.92	Upstream of Montgomery Dam
Sediment	12	2A	0.31	BVPS Outfall Vicinity
Sediment*	3	49a	4.93	Upstream of Montgomery Dam
Drinking Water	15	4	1.26	Midland Water Dept.
Drinking Water	14	5	4.90	East Liverpool Water Dept.

* Site #49a added – control site.



Title:



ODCM: Radiological Environmental Monitoring Program

Title:

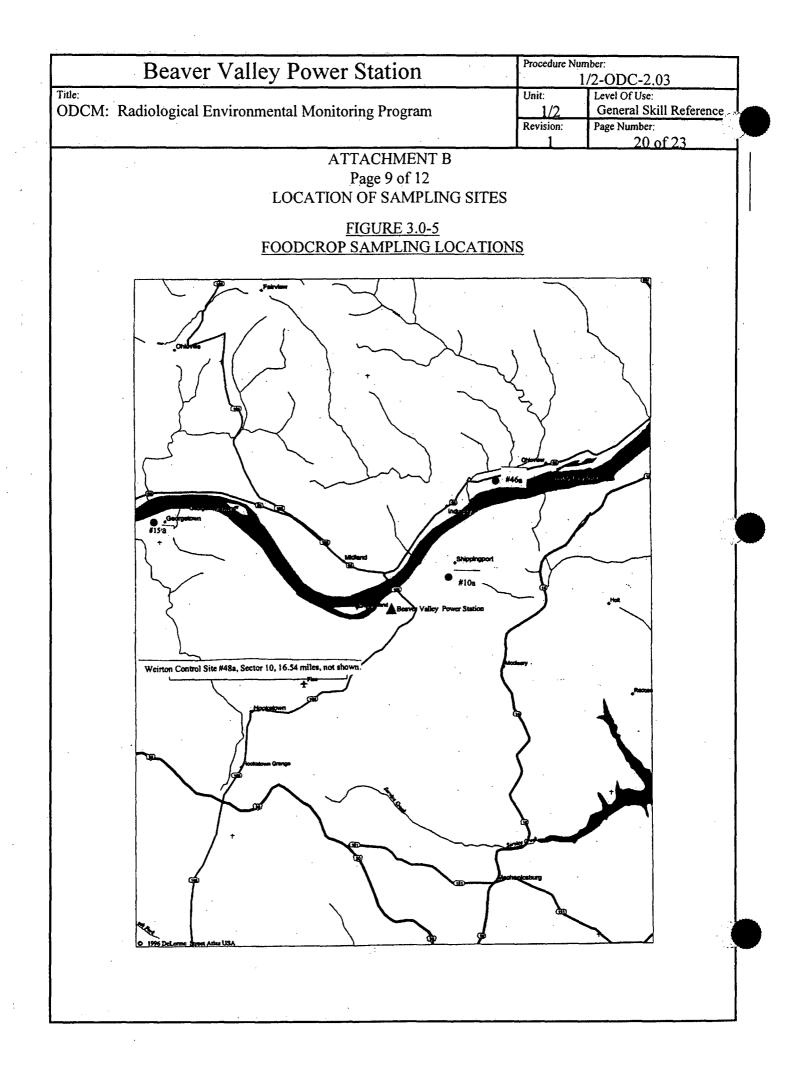
Procedure Number:						
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# FIGURE 3.0-4 (Continued) MILK SAMPLING LOCATIONS

Sector	Site #	Distance (miles)	Location
10	25	2.10	Searight Farm
10	96	10.48	Windsheimer Farm
	*		
	*		
	*		

*Three dairies based on highest deposition factors.

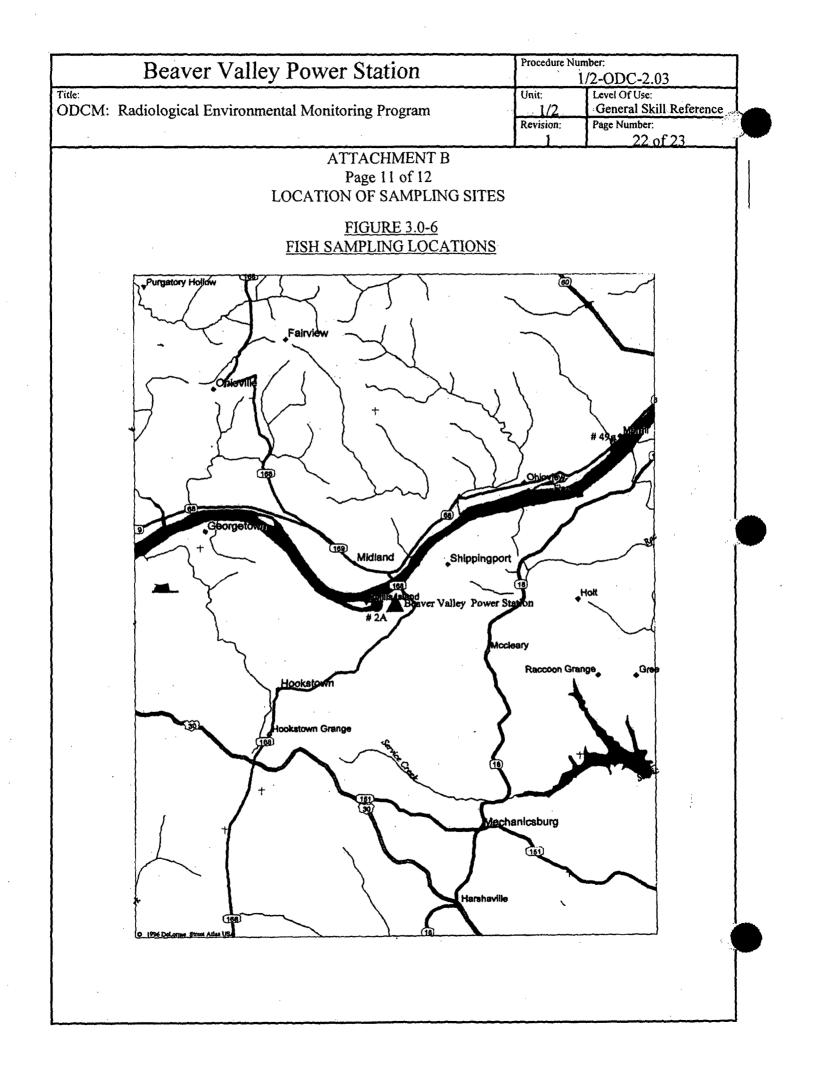


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# Page 10 of 12 LOCATION OF SAMPLING SITES

# FIGURE 3.0-5 (Continued) FOODCROP SAMPLING LOCATIONS

Site #	Description
10a	Shippingport Boro
15a	Georgetown Boro
46a	Industry Boro
48a	Weirton Area



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# ATTACHMENT B Page 12 of 12 LOCATION OF SAMPLING SITES

# FIGURE 3.0-6 (Continued) FISH SAMPLING LOCATIONS

Sector	Site #	Distance (miles)	Location
12	2A	0.31	BVPS Outfall Vicinity
3	49a	4.93	Upstream of Montgomery Dam

# Unit 1/2

#### 1/2-ODC-2.04

#### **ODCM:** Information Related to 40 CFR 190

# Document Owner Manager, Nuclear Environmental & Chemistry

Revision Number	1		
Level Of Use	General Skill Reference		
Safety Related Procedure	Yes		

Beaver Valley Power Station	Procedure N	Procedure Number: 1/2-ODC-2.04			
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2.0 SCOPE					
3.0 REFERENCES AND COMMITMENTS					
3.1 References					
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8.0 PROCEDURE		~			

8.1 8.2

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# 1.0 <u>PURPOSE</u>

- 1.1 This procedure provides the steps to be taken when the Total Dose of ODCM Control 4.11.4.1 exceeds twice the limit of any of the ODCM Controls specifying an Offsite Dose Limit.^(3.1.2)
  - 1.1.1 Prior to issuance of this procedure, these items were located in Section 4 of the old ODCM.

# 2.0 <u>SCOPE</u>

2.1 This procedure is applicable to all station personnel that are qualified to perform activities as described and referenced in this procedure.

# 3.0 REFERENCES AND COMMITMENTS

# 3.1 References

- 3.1.1 40 CFR Part 190
- 3.1.2 1/2-ODC-3.03, ODCM: Controls for RETS and REMP Programs
- 3.1.3 1/2-ADM-1640, Control of the Offsite Dose Calculation Manual
- 3.1.4 1/2-ADM-0100, Procedure Writer's Guide
- 3.1.5 1/2-ADM-0101, Review and Approval of Documents
- 3.1.6 CR 05-01169, Chemistry Action Plan for Transition of RETS, REMP and ODCM. CA-18, Revise procedure 1/2-ODC-2.04 to change document owner from Manager, Radiation Protection to Manager, Nuclear Environmental & Chemistry.

# 3.2 **Commitments**

- 3.2.1 10 CFR 20.405(c), Special Reports
- 3.2.2 NUREG-1301, Offsite Dose Calculation Manual Guidance: Standard Radiological Effluent Controls for Pressurized Water Reactors (Generic Letter 89-01, Supplement No. 1)

# 4.0 <u>RECORDS AND FORMS</u>

# 4.1 <u>Records</u>

4.1.1 Any calculation supporting ODCM changes shall be documented, as appropriate, by a retrievable document (e.g.; letter or calculation package) with an appropriate RTL number.

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itle:		Unit:	Level Of Use:		
DCM: 1	Information Related to 40 CFR 190	Revision:	Page Number: 4 of 6	(	
4.2 <u>F</u>	orms	· · ·			
4.2.1	None	· · · · ·	· .		
5.0 <u>P</u>	RECAUTIONS AND LIMITATIONS	· · · ·			
5.1. T	he Offsite Dose Limits used to show compliance to this proc	edure are as	follows:		
5.1.1	ODCM Control 3.11.2.a; Liquid Effluents: $\leq 1.5$ mrem/c $\leq 5$ mrem/quarter any Organ.	uarter Total	Body or		
5.1.2	ODCM Control 3.11.2.b; Liquid Effluents: $\leq 3$ mrem/yee $\leq 10$ mrem/year any Organ.	ar Total Body	or		
5.1.3	ODCM Control 3.11.2.2.a; Gas Effluent-Noble Gas: $\leq 5 \leq 10$ mrad/quarter Beta	mrad/quarter	Gamma, or		
5.1.4	ODCM Control 3.11.2.2.b; Gas Effluents-Noble Gas: $\leq 20$ mrad/year Beta	10 mrad/year	Gamma		
5.1.5	ODCM Control 3.11.2.3.a; Gas Effluents-Particulates & any organ	Iodines: $\leq 7.5$	5 mrem/quarter		
5.1.6	ODCM Control 3.11.2.3.b; Gas Effluents-Particulates & organ	Iodines: $\leq 15$	mrem/year any		
5.1.7	ODCM Control 3.11.4.1; All Fuel Cycle Sources: $\leq 25$ m Organ, except the thyroid, which is limited to $\leq 75$ m rem		tal Body or any		
5.0 <u>A</u>	CCEPTANCE CRITERIA	•			
m P	any changes to this procedure shall contain sufficient justification naintain the level of radioactive effluent control required by 1 art 190, 10 CFR 50.36a, and Appendix I to 10 CFR 50, and 1 ccuracy or reliability of effluent dose or setpoint calculation.	0 CFR 20.13 not adversely	02, 40 CFR		
6.1.1	All changes to this procedure shall be prepared in accordand $1/2$ -ADM-1640. ^(3.1.3)	ance with 1/2	-ADM-0100 ^(3.1.4)		
6.1.2	All changes to this procedure shall be reviewed and appro $1/2$ -ADM-0101 ^(3.1.5) and $1/2$ -ADM-1640. ^(3.1.3)	oved in accord	lance with		
7.0 <u>P</u>	REREQUISITES		<b>、</b>	•	
7.1 T	he user of this procedure shall be familiar with ODCM struc	ture and cont	ent.	${}_{k}$	

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8.0 <u>PROCEDUR</u>	<u>E</u>			
8.1 Information I	Related To 40 CFR 190			
releases e	L 3.11.4.1 requires that when the calculated of a ceed twice the limits of ODCM CONTROL 3.11.2.3.a, or 3.11.2.3.b, the following shall	3.11.1.2.a, 3.	11.1.2.b, 3.11.2.2.a,	
(inc - com radi ≤ 25	ulations shall be made including direct radia uding outside storage tanks, etc.) to determine mitment to any MEMBER OF THE PUBLIC pactivity and to radiation from uranium fuel of mrem to the total body or any organ, except mrem for a calendar year.	e whether the from all faci cycle sources	e dose or dose lity releases of exceeds the limits of	
8.1.1.1.1	If any of these limits are exceeded, prepare within 30 days a Special Report pursuant to following shall be included in the Special F	0 10 CFR 20.4	the Commission $405(c)$ . The	
8.1.1.1.1.	Define the corrective action to be tak to prevent recurrence of exceeding th CONTROL 3.11.4.1.			
8.1.1.1.1.2	Include the schedule for achieving co ODCM CONTROL 3.11.4.1.	onformance w	ithin the limits of	
8.1.1.1.1.	Include an analysis that estimates the MEMBER OF THE PUBLIC from u including all effluent pathways and d year that includes the release(s) cover	ranium fuel cr irect radiation	ycle sources, 1, for the calendar	
8.1.1.1.1.4	Describe levels of radiation and conc involved, and the cause of exposure l			
8.1.1.1.1.	If the estimated dose(s) exceeds the l CONTROL 3.11.4.1, and if the releas of 40 CFR Part 190 has not already b for a variance in accordance with the Submittal of the report is considered granted until staff action on the reque	se condition re een corrected provisions of a timely reque	esulting in violation , include a request 40 CFR Part 190. est, and a variance is	
	Branne a succession on and roday			

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# 8.2 Inside The Site Boundary Radiation Doses

- 8.2.1 In regards to assessment of radiation doses (from Radioactive Effluents) to MEMBERS OF THE PUBLIC due to their activities inside the site boundary, the following is provided:
  - 8.2.1.1 A separate assessment of radiation doses from radioactive effluents to MEMBERS OF THE PUBLIC due to their activities inside the site boundary is generally not necessary because the exposure time for individuals not occupationally associated with the plant site is minimal in comparison to the exposure time considered for the dose calculation at or beyond the site boundary.
  - 8.2.1.2 For reporting purposes, separate guidance for calculating radiation doses to a MEMBER OF THE PUBLIC inside the site boundary is not needed because the dose assessments for an offsite MEMBER OF THE PUBLIC is also assumed to be for a MEMBER OF THE PUBLIC conducting activities onsite.
    - 8.2.1.2.1 This is verified by showing that the ground release  $\chi/Q$  dispersion parameter used for dose calculation at the site boundary (0.352 miles NW) is greater than the  $\chi/Q$  dispersion parameter at the location where a MEMBER OF THE PUBLIC would most likely have the maximum exposure time (0-0.5 miles N and 0-0.5 miles NNW). A comparison of these  $\chi/Q$ dispersion parameters is as follows:

χ/Q Used for Dose Calculation	χ/Q Where an Assumed MEMBER OF THE PUBLIC Would Most Likely Have the Maximum Exposure Time		MEMBER OF THE PUBLIC Would Most Likely Have the Maximum		χ/Q References from 1/2-ODC-2.02
Site Boundary 0.352 miles NW			See Attachment F		
9.24E-5 sec/m ³	$2.33E-5 \text{ sec/m}^3$	5.47E-5 sec/m ³	Table 2.2-4		
$1.03E-4 \operatorname{sec/m}^3$	$2.76E-5 \text{ sec/m}^3$	6.01E-5 sec/m ³	Table 2.2-5		
$7.35\text{E-5 sec/m}^{3}$	$2.44E-5 \text{ sec/m}^3$	5.57E-5 sec/m ³	Table 22-7		
9.24E-5 sec/m ³	$2.33E-5 sec/m^3$	5.47E-5 sec/m ³	Table 2.2-8		
9.24E-5 sec/m ³	$2.33\text{E-5 sec/m}^3$	5.47E-5 sec/m ³	Table 2.2-9		
$7.35\text{E-5 sec/m}^3$	$2.44E-5 \text{ sec/m}^3$	$5.57\text{E-5 sec/m}^3$	Table 2.2-10		

# Unit 1/2

#### 1/2-ODC-3.01

**ODCM:** Dispersion Calculation Procedure and Source Term Inputs

Document Owner Manager, Nuclear Environmental & Chemistry

Revision Number	1
Level Of Use	General Skill Reference
Safety Related Procedure	Yes

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<ul><li>8.1 Summary of Dispersion and Deposition Methodology</li><li>8.2 Summary of Source Term Inputs</li></ul>		
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# 1.0 <u>PURPOSE</u>

- 1.1 This procedure contains the basic methodology that was used for calculating dispersion  $(\chi/Q)$  and deposition (D/Q).
  - 1.1.1 Prior to issuance of this procedure, these items were located in Appendix A of the old ODCM.
- 1.2 This procedure also contains the input parameters to the various computer codes used by the Licensee and its subcontractors for determination of the liquid and gaseous source term mixes.
  - 1.2.1 Prior to issuance of this procedure, these items were located in Appendix B of the old ODCM.

# 2.0 <u>SCOPE</u>

2.1 This procedure is applicable to all station personnel (including subcontractors) that are qualified to perform activities as described and referenced in this procedure.

# 3.0 <u>REFEFERENCES AND COMMITMENTS</u>

#### 3.1 <u>References</u>

- 3.1.1 NUS-2173, Development Of Terrain Adjustment Factors For Use At the Beaver Valley Power Station, For the Straight-Line Atmospheric Dispersion Model, NUS Corporation, June 1978
- 3.1.2 NUREG/CR-2919, XOQDOQ: Computer Program For The Meteorological Evaluation Of Routine Effluent Releases At Nuclear Power Stations, September, 1982
- 3.1.3 Regulatory Guide 1.23, Meteorological Measurement Program for Nuclear Power Plants
- 3.1.4 Regulatory Guide 1.111, Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents In Routine Releases From Light-Water-Coded Reactors, Revision 1, July 1977
- 3.1.5 NRC Gale Code,
- 3.1.6 SWEC LIQ1BB Code,
- 3.1.7 SWEC GAS1BB Code,
- 3.1.8 NUREG-1301, Offsite Dose Calculation Manual Guidance, Standard Radiological Effluent Controls for Pressurized Water Reactors (Generic Letter 89-01, Supplement No. 1)
- 3.1.9 1/2-ADM-1640, Control of the Offsite Dose Calculation Manual

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3.1.10 1/2-ADM-0100, Procedure Writer's Guide			· · · ·
3.1.11 1/2-ADM-0101, Review and Approval of Docu	iments		
3.1.12 CR 05-01169, Chemistry Action Plan for Trans CA-19, Revise procedure 1/2-ODC-3.01 to cha Radiation Protection to Manager, Nuclear Envi	nge docume	nt owner i	from Manager,
3.2 <u>Commitments</u>		. ·	
3.2.1 None			
4.0 <u>RECORDS AND FORMS</u>	· .		
4.1 <u>Records</u>			
4.1.1 Any calculation supporting generation of disper shall be documented, as appropriate, by a retrie package) with an appropriate RTL number.	-		
4.2 <u>Forms</u>			
4.2.1 None			
5.0 PRECAUTIONS AND LIMITATIONS		•.	
5.1 This procedure contains the information that was pr Appendix B of the previous BV-1 and 2 Offsite Dos			••
5.1.1 In regards to this, the Tables that were transferr the appropriate ATTACHMENTS of this proce an "A" or "B".		• • • • • • • • • • • • • • • • • • •	
6.0 <u>ACCEPTANCE CRITERIA</u>		r	
6.1 Any change to this procedure shall contain sufficient maintain the level of radioactive effluent control rec Part 190, 10 CFR 50.36a and Appendix I to 10 CFR accuracy or reliability of effluent dose or setpoint ca	uired by 10 50, and not	CFR 20.1	302, 40 CFR
6.1.1 All changes to this procedure shall be prepared and 1/2-ADM-1640. ^(3.1.9)	in accordan	ce with 1/2	2-ADM-0100 ^(3.1.10)
6.1.2 All changes to this procedure shall be reviewed $1/2$ ADM-0101 ^(3.1.1) and $1/2$ -ADM-1640. ^(3.1.9)	and approv	ed in acco	rdance with
7.0 PREREQUISITES			

7.1 The user of this procedure shall be familiar with ODCM structure and content.

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# 8.0 <u>PROCEDURE</u>

- 8.1 Summary of Dispersion and Deposition Methodology
  - 8.1.1 Annual average and grazing season average values of relative concentration  $(\chi/Q)$  and deposition (D/Q) were calculated for continuous and intermittent gaseous releases of activity from the site according to the straight-line airflow (Gaussian) model described in RG-1.111.^(3.1.4)
    - 8.1.1.1 Undecayed and undepleted sector average χ/Q and D/Q values were obtained for
      each of sixteen 22.5-degree sectors at the site boundary and maximum individual receptors.
    - 8.1.1.2 For an elevated release, (i.e.; occurring at a height that is twice the height or more of a nearby structure) credit was taken for the effective release height which is comprised of the physical release height plus momentum plume rise minus the terrain height at a given receptor.
    - 8.1.1.3 A building wake correction factor was used to adjust calculations for ground-level releases.
    - 8.1.1.4 Airflow reversals were also accounted for by applying site-specific terrain recirculation factors for both ground and elevated releases at the site.^(3.1.1)
    - 8.1.1.5 The methodology employed in the calculation of intermittent release  $\chi/Q$  and D/Q values is that described in NUREG/CR-2919.^(3.1.2)
  - 8.1.2 The site continuous gaseous release points that have been evaluated include the following:
    - 8.1.2.1 PV-1/2: The Unit 1/2 Gaseous Waste/Process Vent attached to the Unit 1 natural draft cooling tower
    - 8.1.2.2 CV-1 and CV-2: The Unit 1 Rx Containment/SLCRS Vented the Unit 2 SLCRS Filtered Pathway
    - 8.1.2.3 VV-1 and VV-2: The Unit 1 Ventilation Vent and the Unit 2 SLCRS Unfiltered Pathway
    - 8.1.2.4 TV-2: The Unit 2 Turbine Building Vent
    - 8.1.2.5 CB-2: The Unit 2 Condensate Polishing Building Vent
    - 8.1.2.6 DV-2: The Unit 2 Decontamination Building Vent
    - 8.1.2.7 WV-2: The Unit 2 Gaseous Waste Storage Tank Vault Vent
  - 8.1.3 The intermittent releases are from PV-1/2, VV-1, VV-2, CV-1 and CV-2.

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trea	ly PV-1/2 was considered to be an elevated release with tted as ground level releases. A summary of the release ations is given in ATTACHMENT A.		
	site meteorological data for the period January 1, 1976 re used as input for the annual-average calculations.	through De	ecember 31, 1980
8.1.5.1	The grazing season was represented by a six-month October 31 for each year of the 5-year meteorologic season corresponds reasonably well with the growin	al data base	
8.1.5.2	The data were collected according to guidance in NI in Section 2.3 of the BVPS-2 FSAR.	RC RG-1.2	3 ^(3.1.3) as described
8.1.5.3	The parameters used in the $\chi/Q$ and D/Q calculation direction, and $\Delta T$ as an indicator of atmospheric stal (35 ft) and $\Delta T$ (150-35 ft) were used for all release p which required the use of 500 ft winds and $\Delta T$ (500- of the release height (510 ft).	oility. The ooints excer	lower level winds of the Process Vent
inte	e annual average and grazing season $\chi/Q$ and D/Q value rmittent radioactive releases were calculated at the site rest vegetable garden, nearest milk cow, nearest milk g	boundary,	nearest resident,
8.1.6.1	In the case of the Process Vent releases, several of e evaluated in each downwind sector to determine the values.	-	• •
8.1.6.2	The distances of the limiting maximum individual re release points are given in ATTACHMENT E (Tabl		
8.1.6.3	The continuous release annual average $\chi/Q$ values a Containment Vents, Ventilation Vents, Process Ven Decontamination Building Vent, Waste Gas Storage Polishing Building Vent are given in ATTACHMEN 2.2-10) of 1/2-ODC-2.02. Continuous release annua	t, Turbine Ε Vault Ven NT F (Table al average χ	Building Vents, t, and Condensate es 2.2-4 through t/Q's for these same
8.1.6.4	release points are also given at ten incremental down Continuous release D/Q values for these same release ATTACHMENT K (Tables 2.3-21 through 2.3-27) 0-5 mile incremental distances, and in ATTACHME 2.3-34) of 1/2-ODC-2.02 for the special locations.	e points are of 1/2-OD	e given in C-2.02 for the same
8.1.6.5	Due to their location adjacent to the Containment Bu Building and Gaseous Waste Storage Tank Vault $\chi/c$ the Containment Vent $\chi/Q$ 's and D/Q's.	•	

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- 8.1.6.6 Likewise, the Turbine Building Vent  $\chi/Q$ 's and D/Q's apply to the Condensate Polishing Building as well due to its location adjacent to the Turbine Building.
- 8.1.7 ATTACHMENT M (Tables 2.3-35 through 2.3-38) of 1/2-ODC-2.02 contain short term  $\chi/Q$  values for batch releases originating from the Containment Vent, Ventilation Vent, and Process Vent releases respectively.
  - 8.1.7.1 The values in these tables are based on 32 hours per year of Containment and Ventilation Vent purges and 74 hours per year of Process Vent purges.

# 8.2 <u>Summary of Source Term Inputs</u>

- 8.2.1 Liquid Source Term Inputs
  - 8.2.1.1 Inputs to the NRC Gale Code used for generation of BV-1 Liquid Source Term Mixes are shown in ATTACHMENT B (Table B:1a).
  - 8.2.1.2 Inputs to the SWEC LIQ1BB Code used for generation of BV-2 Liquid Source Term Mixes are shown in ATTACHMENT B (Table B:1b)

#### 8.2.2 Gaseous Source Term Inputs

- 8.2.2.1 Inputs to the SWEC GAS1BB Code for generation of BV-1 Gaseous Source Term Mixes are shown in ATTACHMENT C (Table B:2a)
- 8.2.2.2 Inputs to the SWEC GAS1BB Code for generation of BV-2 Gaseous Source Term Mixes are shown in ATTACHMENT C (Table B:2b)

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·		TABLE A.1			
	VV-1 VENTILATION VENT (PAB EXHAUST)	CV-1 RX CONTAINMENT/ SLCRS VENT	PV-1/2 GASEOUS WASTE/PROCESS VENT		TV-2 TURBINE BUILDING VENT
-	VV-2 SLCRS UNFILTERED PATHWAY	CV-2 RX CONTAINMENT/ SLCRS FILTERED PATHWAY		,	· .
TYPE OF RELEASE	GROUND LEVEL	GROUND LEVEL	ELEVATED		GROUND LEVEL
;	Long Term And Short Term	Long Term And Short Term	Long Term And Short Term		Long Term And Short Term
Release Point Height (m)	26	47		155	33
Adjacent Building Height (m)	19	44		155	33
Relative Loca tion To Adjacent Structures	E. Side Of Primary Auxiliary Bldg	Top Center Of Containment Dome	Atop Cooling Tower		Turbine Building
Exit Velocity(m/sec)	NA	NA		9.4	NA
Internal Stack Diameter (m)	NA	NA	0.25		NA
Building Cross- Sectional Area (m ² )	1600	1600	NA		NA
Purge Frequency* (hours/year)	32	32		74	NA
Purge Duration (hrs/release)	8	8		NA	NA

*Applied to Short Term calculations only

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<u></u>			ATTACHN	MENT B				<u> </u>	
			Page 1						
		LIQU	JID SOURCE	TERM INF	PUTS				
• .			TABLE	R Ha					
INPUTS TO C	GALE CODE	FOR GEN			UID SOL	IRCE T	ERM N	AIXES	
BV-1 PWR INPUTS						VALUE			
Thermal Power	Level (megav	vatts)		a.		276	6.000		
Plant Capacity Factor						.800			
Mass Of Primary Coolant (thousand lbs)						345.000			
Percent Fuel With Cladding Defects						.120			
Primary System	Letdown Rat	e (gpm)				6	0.000		
Letdown Cation Demineralizer Flow						6.000			
Number Of Steam Generators						-	3.000		
Total Steam Flow (million lbs/hr)							1.620		
Mass Of Steam In Each Steam Generator (thousand lbs) Mass Of Liquid In Each Steam Generator (thousand lbs)							6.772 7.000		
Mass Of Liquid	in Each Stear	n Generator	(thousand los)			. 9	7.000		
Total Mass Of S	Secondary Co	olant (thousa	nd lbs)			129	6.000		
Mass Of Water						29	1.000		
Blowdown Rate (thousand lbs/hr)						33.900			
Primary To Secondary Leak Rate (lbs/day)						10	0.000		
Fission Product	Carry-Over F	raction					.001		
Halogen Carry-	Over Fraction						.010		
Condensate Demineralizer Flow Fraction						0.000			
Radwaste Diluti	ion Flow (tho	usand gpm)				22	2.500		
	2		:						
· · · · · · · · · · ·	•	BA-1	LIQUID WAST	TE INPUTS				·····	
		· · · · · · · · · · · · · · · · · · ·		COLLECTION				ATION	
	FLOW RATE	FRACTION	FRACTION	COLLECTION TIME	TIME	F	ACTOR	S	
	FLOW RATE (gal/day)	· · · · · · · · · · · · · · · · · · ·		COLLECTION			ACTOR		
	•	FRACTION	FRACTION	COLLECTION TIME	TIME	F	Cs (	S	
STREAM	(gal/day)	FRACTION OF PCA	FRACTION DISCHARGE	COLLECTION TIME (days)	TIME (days)	F	ACTOR Cs ( 1E7	S OTHERS	
STREAM Shim Bleed Rate Equipment	(gal/day) 1.32E4	FRACTION OF PCA 1.000	FRACTION DISCHARGE 0.000	COLLECTION TIME (days) 11.260	TIME (days) 7.220	F I 1E7	ACTOR Cs ( 1E7	S <u>OTHERS</u> 1E7	
STREAM Shim Bleed Rate Equipment Drains Clean Waste	(gal/day) 1.32E4 6.00E2	FRACTION OF PCA 1.000 1.000	FRACTION DISCHARGE 0.000 0.000	COLLECTION TIME (days) 11.260 11.260	TIME (days) 7.220 7.220	I 1E7 1E7	ACTOR Cs ( 1E7 1E7	<u>S</u> DTHERS 1E7 1E7	
STREAM Shim Bleed Rate Equipment Drains Clean Waste Input Dirty Waste	(gal/day) 1.32E4 6.00E2 7.50E1	FRACTION OF PCA 1.000 1.000 1.000	FRACTION DISCHARGE 0.000 0.000 1.000	COLLECTION TIME (days) 11.260 11.260 0.071	TIME (days) 7.220 7.220 0.648	F 1E7 1E7 1E5	ACTOR Cs ( 1E7 1E7 2E4	<u>S</u> <u>DTHERS</u> 1E7 1E5	

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	•	T.T.	QUID SOURC		NPLITS				
					111 0 1 5				
				LE B:1b					
INPUTS T	O SWEC LI		E FOR GENER		BV-2 LIQ	UID SC	OURCE '		S
	·····	BV-	2 PWR INPUTS	)		i,	<u> </u>	VALUE	
Therr	nal Power Lev	vel (megawa	tts)					2766.000	
Plant	Capacity Fact	tor						.800	
	Of Primary C							385.000	
	nt Fuel With							.120	
Prima	ary System Le	adown Kate	(gpm)			·,	: :	57.000	
Letdo	wn Cation De	emineralizer	Flow		:			5.700	
	ber Of Steam							3.000	
	Steam Flow (							11.600	
			Generator (thous Generator (thous					8.700 100.000	
Mass		Each Steam	Generator (mou	sallu lus)				100.000	
Total	Mass Of Seco	ondary Coola	ant (thousand lbs	5)				2000.000	
			ator (thousand II	os)	۰.			298.000	•
	down Rate (th							22.300 100.000	
	ary To Second on Product Ca							.001	
1 10010			otion .						
	gen Carry-Ove							.010	
	ensate Demin					• •	•	.700	
Kadw	aste Dilution	Flow (thousa	and gpm)					7.800	
		۰.							
		B	SV-2 LIQUID W	ASTE INPUT COLLECTIO			CONTAN	AINATION	-
	FLOW RATE	FRACTION	FRACTION	TIME	TIME	DEC	FACT(		
STREAM	(gal/day)	OF PCA	DISCHARGE	(hrs)	(hrs)	Í	CsRb	OTHERS	
Cintain	40	1 000	1.0	25 E	()	1122	1174	184	
Containment Sump	40	1.000	1.0	35.5	6.2	1E3	1E4	1E4	
	200	0.100	1.0	35.5	6.2	1E3	1E4	IE4	
Auxiliary Building Sump	200	0.100	1.0	52.5	0.2	163	124	104	
Miscellaneous	700	0.010	1.0	35.5	6.2	1E3	1E4	1E4	
Sources	700	0.010	1.0		0.2	165		11.77	
Rx Plant	35	1.000	1.0	35.5	6.2	1E3	1E4	1E4	
Samples					<b>_</b>	- <b>- - -</b> -			
Lab Drains	400	0.002	1.0	35.5	6.2	1E3	1E4	1E4	
Cond. Demin.	2685	1.1E-4	1.0	35.5	6.2	1E3	1E4	1E4	
Rinse Water	2005	1.115-4	1.0		0.2	CTT.	11.4	11.4	
								1	
CVCS	60		1.0	1300	173	1F4	4F3	1E5	
CVCS Turbine	60 7200		1.0 1.0	1300	173 	1E4	4E3	1E5	

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GASEOUS SOURCE TERM INPUT	5	. *
TABLE B:2a		
INPUTS TO SWEC GAS1BB CODE FOR GENERATION OF BV-1 GAS	EOUS SOUR	CE TERM MIXES
BV-1 PWR INPUTS	<u> </u>	VALUE
Thermal Power Level (megawatts)		2766.000
Plant Capacity Factor		.800
Mass Of Primary Coolant (thousand lbs)		385.000
Percent Fuel With Cladding Defects		.120 57.000
Primary System Letdown Rate (gpm)		
Letdown Cation Demineralizer Flow Number Of Steam Generators		5.700 3.000
Total Steam Flow (million lbs/hr)		11.600
Mass Of Steam In Each Steam Generator (thousand lbs)	•	8.700
Mass Of Liquid In Each Steam Generator (thousand lbs)		100.000
Total Mass Of Secondary Coolant (thousand lbs)		2000.000
Mass Of Water In Steam Generator (thousand lbs)	٠.	298,000
Blowdown Rate (thousand lbs/hr)		52.000
Primary To Secondary Leak Rate (lbs/day)		100.000
Fission Product Carry-Over Fraction		.001
Halogen Carry-Over Fraction		.010
Condensate Demineralizer Flow Fraction		0.000
Radwaste Dilution Flow (thousand gpm)		15.000
BV-1.GASEOUS WASTE INPUTS		VALUE
There Is Not Continuous Stripping Of Full Letdown Flow	-	39.000
Hold Up Time For Xenon (days)		2.000
Hold Up Time For Krypton (days) Primary Coolant Leak To Auxiliary Building (lb/day)		160.000
Auxiliary Building Leak Io Auxiliary Building (10/day)		7.5E-3
Gas Waste System Particulate Release Fraction		0.000
Auxiliary Building Charcoiodine Release Fraction		1.000
Auxiliary Building Particulate Release Fraction		1.000
Containment Volume (million cu-ft)		1.800
Frequency Of Primary Coolant Degassing (times/yr)		2.000
Primary To Secondary Leak Rate (lb/day)	•	100.000
There Is A Kidney Filter		
Containment Atmosphere Cleanup Rate (thousand cfm)		2.000
Purge Time Of Containment (hours)		8.000
There Is Not A Condensate Demineralizer		• •
Iodine Partition Factor (gas/liq) In Steam Generator		0.010
Frequency Of Containment Building High Vol Purge (times/yr)*		4.000
		1.000
Containment Volume Purge Iodine Release Fraction		1.000
Containment Volume Purge Iodine Release Fraction Containment Volume Purge Particulate Release Fraction		1700.000
Containment Volume Purge Iodine Release Fraction Containment Volume Purge Particulate Release Fraction Steam Leak To Turbine Building (lbs/hr)		
Containment Volume Purge Iodine Release Fraction Containment Volume Purge Particulate Release Fraction Steam Leak To Turbine Building (lbs/hr) Fraction Iodine Released From Blowdown Tank Vent		0.000
Containment Volume Purge Iodine Release Fraction Containment Volume Purge Particulate Release Fraction Steam Leak To Turbine Building (lbs/hr)	·	

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GASEOUS SOURCE TERM INPU	TS	
TABLE B:2b		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
INPUTS TO SWEC GAS1BB CODE FOR GENERATION OF BV-2 GA	ASEOUS SOUR	CE TERM MIXES
BV-2 PWR INPUTS	* ++- +	VALUE
Thermal Power Level (megawatts) Plant Capacity Factor		2766.000 .800
Mass Of Primary Coolant (thousand lbs)		385.000
Percent Fuel With Cladding Defects		.120
Primary System Letdown Rate (gpm)		57.000
Letdown Cation Demineralizer Flow	. ,	5.700
Number Of Steam Generators	. :	3.000
Total Steam Flow (million lbs/hr)	· · · · ·	11.600
Mass Of Steam In Each Steam Generator (thousand lbs)	• •	8.700
Mass Of Liquid In Each Steam Generator (thousand lbs)		100.000
Total Mass Of Secondary Coolant (thousand lbs)	· · · · ·	2000.000
Mass Of Water In Steam Generator (thousand lbs)		298.000
Blowdown Rate (thousand lbs/hr)	2.1	22.300
Primary To Secondary Leak Rate (lbs/day)		100.000
Fission Product Carry-Over Fraction	ι.	.001
Halogen Carry-Over Fraction		.010
Condensate Demineralizer Flow Fraction		.700
Radwaste Dilution Flow (thousand gpm)		7.800
BV-2 GASEOUS WASTE INPUTS		VALUE
There Is Not Continuous Stripping Of Full Letdown Flow		:
Hold Up Time For Xenon (days)		45.800
Hold Up Time For Krypton (days)		2.570
Primary Coolant Leak To Auxiliary Building (lb/day)		160.000
Auxiliary Building Leak Iodine Partition Factor		7.5E-3
Gas Waste System Particulate Release Fraction		0.000
Auxiliary Building Charcologine Release Fraction	· · · ·	0.100 0.010
Auxiliary Building Particulate Release Fraction	·**	1.800
Containment Volume (million cu-ft) Frequency Of Primary Coolant Degassing (times/yr)	• . • • • •.	2.000
Primary To Secondary Leak Rate (lb/day)		100.000
There Is A Kidney Filter		100.000
Containment Atmosphere Cleanup Rate (thousand cfm)	·	20.000
Purge Time Of Containment (hours)		8.000
There Is Not A Condensate Demineralizer		
Iodine Partition Factor (gas/liq) In Steam Generator		0.010
Frequency Of Containment Building High Vol Purge (times/yr)*	entre de traind	4.000
Containment Volume Purge Iodine Release Fraction		1.000
Containment Volume Purge Particulate Release Fraction	er e ye	1.000
Steam Leak To Turbine Building (lbs/hr)		1700.000
Fraction Iodine Released From Blowdown Tank Vent		0.000
Fraction Iodine Released From Main Condensate Air Ejector		0.270
There Is Not A Cryogenic Off Gas System		

*2 cold and 2 hot purges

# Unit 1/2

# 1/2-ODC-3.02

**ODCM: Bases For ODCM Controls** 

## Document Owner Manager, Nuclear Environmental and Chemistry

Revision Number	2
Level Of Use	General Skill Reference
Safety Related Procedure	Yes

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## 1.0 <u>PURPOSE</u>

- 1.1 This procedure contains the Bases for the ODCM Controls that were transferred from the Bases Section of the Technical Specification per Unit 1/2 Amendments 1A-188/2A-70, and in accordance with Generic Letter 89-01 and NUREG-1301 (Generic Letter 89-01, Supplement No. 1) [ITS] and T.S. 5.5.2.^(3.1.5, 3.2.10)
  - 1.1.1 Prior to issuance of this procedure, these items were located in Appendix D of the old ODCM.
- 1.2 This procedure also contains the Bases for the ODCM Controls (for Radiation Monitoring Instrumentation) that were duplicated from the Bases Section of the Technical Specification per Unit 1/2 Amendments 1A-246/2A-124, and in accordance with NUREG-1431.^(3.1.6, 3.2.11)
- 1.3 This procedure also contains the Bases for the ODCM Controls (for Liquid Holdup Tank Activity Limits and for Gas Decay/Storage Tank Activity Limits) that were transferred from the Bases Section of the Technical Specification per Unit 1/2 Amendments 1A-250/2A-130, and in accordance with NUREG-1431.^(3.1.7, 3.2.11)

#### 2.0 <u>SCOPE</u>

2.1 This procedure is applicable to all station personnel that are qualified to perform activities as described and referenced in this procedure.

# 3.0 <u>REFERENCES AND COMMITMENTS</u>

#### 3.1 <u>References</u>

- 3.1.1 1/2-ODC-2.01, ODCM: Liquid Effluents
- 3.1.2 1/2-ODC-2.02, ODCM: Gaseous Effluents
- 3.1.3 1/2-ODC-3.03, ODCM: Controls for RETS and REMP Programs
- 3.1.4 1/2-ADM-1640, Control of the Offsite Dose Calculation Manual
- 3.1.5 Unit 1/2 Technical Specification 6.8.6, including Amendments 1A-188/2A-70 (LAR 1A-175/2A-37), Implemented August 7, 1995
- 3.1.6 Unit 1/2 Technical Specification 3.3.3.1, including Amendments 1A-246/2A-124 (LAR 1A-287/2A-159), Implemented April 11, 2002
- 3.1.7 Unit 1/2 Technical Specifications 3.11.1.4, 3.11.2.5 and 6.8.6, including Amendments 1A-250/2A-130 (LAR 1A-291/2A-163), Implemented August 7, 2002
- 3.1.8 1/2-ADM-0100, Procedure Writer's Guide
- 3.1.9 1/2-ADM-0101, Review and Approval of Documents

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- 3.1.10 CR 05-01169, Chemistry Action Plan for Transition of RETS, REMP and ODCM.
   CA-20, Revise procedure 1/2-ODC-3.02 to change document owner from Manager,
   Radiation Protection to Manager, Nuclear Environmental and Chemistry. CR 05-03306,
   Incorporated Improved Technical Specifications (ITS).
- 3.1.11 **[ITS]** T.S. 5.5.2
- 3.2 <u>Commitments</u>
  - 3.2.1 10 CFR Part 20
  - 3.2.2 10 CFR Part 50
  - 3.2.3 40 CFR Part 141
  - 3.2.4 40 CFR Part 190
  - 3.2.5 Regulatory Guide 1.109, Calculation Of Annual Doses To Man From Routine Releases Of Reactor Effluents For The Purpose Of Evaluating Compliance With 10 CFR Part 50, Appendix I, Revision 1, October, 1977
  - 3.2.6 Regulatory Guide 1.111, Methods For Estimating Atmospheric Transport And Dispersion of Gaseous Effluents In Routine Releases From Light-Water-Cooled Reactors, Revision 1, July, 1977
  - 3.2.7 Regulatory Guide 1.113, Estimating Aquatic Dispersion Of Effluents From Accidental And Routine Reactor Releases For The Purpose Of Implementing Appendix I, April, 1977
  - 3.2.8 NUREG-0133, Preparation of Radiological Effluent Technical Specifications for Nuclear Power Plants, October 1978
  - 3.2.9 NUREG-0737, Clarification of TMI Action Plan Requirements, October, 1980
  - 3.2.10 NUREG-1301, Offsite Dose Calculation Manual Guidance. Standard Radiological Effluent Controls For Pressurized Water Reactors (Generic Letter 89-01, Supplement No. 1)
  - 3.2.11 NUREG-1431, Standard Technical Specifications Westinghouse Plants Specifications

#### 4.0 RECORDS AND FORMS

#### 4.1 <u>Records</u>

4.1.1 Any calculation supporting ODCM changes shall be documented, as appropriate, by a retrievable document (eg; letter or calculation package) with an appropriate RTL number.

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# 4.2 Forms

### 4.2.1 None

# 5.0 PRECAUTIONS AND LIMITATIONS

- 5.1 The numbering of each specific ODCM Bases contained in this procedure does not appear to be sequential. This is intentional, as all ODCM Bases numbers remained the same when they were transferred from the Technical Specifications. This was done in an effort to minimize the amount of plant procedure changes and to eliminate any confusion associated with numbering changes.
- 5.2 This procedure includes Improved Technical Specifications (**[ITS]**) information that is NOT applicable to current Technical Specifications (**[CTS]**) and **[CTS]** information that is NOT applicable in **[ITS]**. The **[CTS]** information shall be used prior to the **[ITS]** effective date. The **[ITS]** information shall be used on or after the **[ITS]** effective date.

# 6.0 ACCEPTANCE CRITERIA

- 6.1 Any change to this procedure shall contain sufficient justification that the change will maintain the level of radioactive effluent control required by 10 CFR 20.1302, 40 CFR Part 190, 10 CFR 50.36a, and Appenidx I to 10 CFR 50, and not adversely impact the accuracy or reliability of effluent dose or setpoint calculation.^(3.2.10)
  - 6.1.1 All changes to this procedure shall be prepared in accordance with 1/2-ADM-0100^(3.1.8) and 1/2-ADM-1640.^(3.1.4)
  - 6.1.2 All changes to this procedure shall be reviewed and approved in accordance with 1/2-ADM-0101^(3.1.9) and 1/2-ADM-1640.^(3.1.4)

# 7.0 **PREREQUISITES**

7.1 The user of this procedure shall be familiar with ODCM structure and content.

# 8.0 <u>PROCEDURE</u>

- 8.1 See ATTACHMENT A for a complete description of Bases for ODCM Controls associated with Instrumentation.
- 8.2 See ATTACHMENT B for a complete description of Bases for ODCM Controls associated with Liquid Effluents.
- 8.3 See ATTACHMENT C for a complete description of Bases for ODCM Controls associated with Gaseous Effluents.
- 8.4 See ATTACHMENT D for a complete description of Bases for ODCM Controls associated with Total Dose.

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# 8.5 See ATTACHMENT E for a complete description of Bases for ODCM Controls associated with the Radiological Environmental Monitoring Program (REMP).

-END-

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ATTACHMENT A		
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BASES FOR ODCM CONTROLS: INSTRU	MENTATION	ſ
RADIATION MONITORING INSTRUMENTATION		
The OPERABILITY of the radiation monitoring cha	annels ensures	that: 1) the radiation
	-	-
recommendations of NUREG-0737. ^(3.2.9)		
RADIOACTIVE LIQUID FEELUENT MONITORI	NG INSTRUM	<b>IENTATION</b>
Millione III Elgoid EITEOENT MONITON		ILINIATION
The radioactive liquid effluent instrumentation is pr	ovided to mon	itor and control, as
applicable, the releases of radioactive materials in li	quid effluents	during actual or
potential releases of liquid effluents. The alarm/trip	setpoints for t	hese instruments sha
be calculated in accordance with Section 1 of this m	anual to ensure	e that the alarm/trip
will occur prior to exceeding the limits of 10 CFR P	art 20. The Ol	PERABILITY and
use of this instrumentation is consistent with the req	uirements of C	eneral Design
Criteria 60, 63, and 64 of Appendix A to 10 CFR Pa	art 50. $(3.2.1, 3.2.2)$	
RADIOACTIVE GASEOUS EFFLUENT MONITO	DRING INSTR	<u>UMENTATION</u>
The radioactive gaseous effluent instrumentation is	provided to mo	onitor and control, as
· . · ·	-	
potential releases of gaseous effluents. The alarm/tr	rip setpoints for	r these instruments
shall be calculated in accordance with Section 2 of t	his manual to e	ensure that the
alarm/trip will occur prior to exceeding the limits of	f 10 CFR Part 2	20. This
instrumentation also includes provisions for monitor	ring (and contr	olling) the
· · · · ·	•	
The OPERABILITY and use of this instrumentation	i is consistent v	vith the requirements
of General Design Criteria 60, 63, and 64 of Append	dix A to 10 CF	R Part 50. $(3.2.1, 3.2.2)^{\circ}$
		· · · · · ·
	The OPERABILITY of the radiation monitoring chi- levels are continually measured in the areas served i alarm or automatic action is initiated when the radia and 3) sufficient information is available on selected assess these variables following an accident. This c recommendations of NUREG-0737. ^(3.2.9) <u>RADIOACTIVE LIQUID EFFLUENT MONITOR</u> The radioactive liquid effluent instrumentation is pr applicable, the releases of radioactive materials in li- potential releases of liquid effluents. The alarm/trip be calculated in accordance with Section 1 of this m will occur prior to exceeding the limits of 10 CFR F use of this instrumentation is consistent with the rec Criteria 60, 63, and 64 of Appendix A to 10 CFR Pa <u>RADIOACTIVE GASEOUS EFFLUENT MONITOR</u> The radioactive gaseous effluent instrumentation is applicable, the releases of radioactive materials in g potential releases of gaseous effluents. The alarm/trip shall be calculated in accordance with Section 2 of t alarm/trip will occur prior to exceeding the limits of instrumentation also includes provisions for monito concentrations of potentially explosive gas mixtures The OPERABILITY and use of this instrumentation	The OPERABILITY of the radiation monitoring channels ensures levels are continually measured in the areas served by the individu alarm or automatic action is initiated when the radiation level trips and 3) sufficient information is available on selected plant paramet assess these variables following an accident. This capability is cor

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ATTACHMENT B	·		

# Page 1 of 2 BASES FOR ODCM CONTROLS: LIQUID EFFLUENTS

## 3/4.11.1.1 LIQUID EFFLUENT CONCENTRATION

This CONTROL is provided to ensure that the concentration of radioactive materials released in Liquid waste effluents from the site to unrestricted areas will be less than 10 times the EC's specified in 10 CFR Part 20, Appendix B (20.1001-20-2402), Table 2, Column 2. This limitation provides additional assurance that the levels of radioactive materials in bodies of water outside the site will result in exposure within (1) the Section II.A design objectives of Appendix I, 10 CFR Part 50, to an individual and (2) the limits of 10 CFR Part 20.1302 to the population. The concentration limit for dissolved or entrained noble gases is based upon the assumption that Xe-135 is the controlling radioisotope and its MPC in air (submersion) was converted to an equivalent concentration in water using the methods described in International Commission on Radiological Protection (ICRP) Publication 2.^(3.2.1, 3.2.2)

#### 3/4.11.1.2 LIQUID EFFLUENT DOSE

This CONTROL is provided to implement the requirements of Sections II.A, III.A, and IV.A of Appendix I, 10 CFR Part 50. The Limiting Condition for Operation implements the guides set forth in Section II.A of Appendix I. The ACTION statements provide the required operating flexibility and at the same time implement the guides set forth in Section IV.A of Appendix I to assure that the releases of radioactive material in liquid effluents will be kept "as low as is reasonably achievable." Also, for fresh water sites with drinking water supplies which can be potentially affected by plant operations, there is reasonable assurance that the operation of the facility will not result in radionuclide concentrations in the finished drinking water that are in excess of the requirements of 40 CFR 141. The dose calculations in the procedure 1/2-ODC-2.01 implement the requirements in Section III.A of Appendix I that conformance with the guides of Appendix I is to be shown by calculational procedures based on models and data such that the actual exposure of an individual through appropriate pathways is unlikely to be substantially underestimated. The equations specified in procedure 1/2-ODC-2.01 for calculating the doses due to the actual release rates of radioactive materials in liquid effluents are consistent with the methodology provided in Regulatory Guide 1.109, and Regulatory Guide 1.113. NUREG-0133 provides methods for dose calculations consistent with Regulatory Guides 1.109 and 1.113.^{(3.1.1, 3.2.2, 3.2.3, 3.2.5, 3.2.7,} 3.2.8)

This CONTROL applies to the release of liquid effluents for Beaver Valley Power Station, Unit No. 1 or Unit No. 2. These units have shared radwaste treatment systems, the liquid effluents from the shared system are proportioned among the units sharing that system.

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## BASES FOR ODCM CONTROLS: LIQUID EFFLUENTS

#### 3/4.11.1.3 <u>LIQUID WASTE TREATMENT SYSTEM</u>

The CONTROL that the appropriate portions of this system be used when specified provides assurance that the releases of radioactive materials in liquid effluents will be kept "as low as is reasonably achievable." This specification implements the requirements of 10 CFR Part 50.36a, General Design Criterion 60 of Appendix A to 10 CFR Part 50 and design objective given in Section II.D of Appendix I to 10 CFR Part 50. The specified limits governing the use of appropriate portions of the liquid radwaste treatment system were specified as a suitable fraction of the dose design objectives set forth in Section II.A of Appendix I, 10 CFR Part 50, for liquid effluents. This specification applies to Beaver Valley Power Station, Unit No. 1 or Unit No. 2.^(3.2.2)

#### 3/4.11.1.4 LIQUID HOLDUP TANKS

Restricting the quantity of radioactive material contained in the specified tanks provides assurance that in the event of an uncontrolled release of the tanks' contents, the resulting concentrations would be less than the limits of 10 CFR Part 20, Appendix B, Table 2, Column 2, at the nearest potable water supply and the nearest surface water supply in an unrestricted area.

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# Page 1 of 3 BASES FOR ODCM CONTROLS: GASEOUS EFFLUENTS

#### 3/4.11.2.1 GASEOUS EFFLUENT DOSE RATE

This CONTROL is provided to ensure that the dose at anytime at the site boundary from gaseous effluents from all units on the site will be within the annual dose limits of 10 CFR Part 20 for unrestricted areas. The annual dose limits are the doses associated with the concentrations of 10 CFR Part 20, Appendix B, Table II, Column 1. These limits provide reasonable assurance that radioactive material discharged in gaseous effluents will not result in the exposure of an individual in an unrestricted area, either within or outside the site boundary, to annual average concentrations exceeding the limits specified in Appendix B, Table II of 10 CFR Part 20 (10 CFR Part 20.106(b)). For individuals who may at times be within the site boundary, the occupancy of the individual will be sufficiently low to compensate for any increase in the atmospheric diffusion factor above that for the site boundary. The specified release rate limits restrict, at all times, the corresponding gamma and beta dose rates above background to an individual at or beyond the site boundary to  $\leq$  500 mrem/year to the total body or to  $\leq$  3,000 mrem/year to the skin. These release rate limits also restrict, at all times, the corresponding thyroid dose rate above background of a child via the inhalation pathway  $to \le 1,500 \text{ mrem/year.}^{(3.2.1)}$ 

#### 3/4.11.2.2 DOSE, NOBLE GASES

This CONTROL is provided to implement the requirements of Sections II.B, III.A, and IV.A of Appendix I, 10 CFR Part 50. The CONTROL implements the guides set forth in Section II.B of Appendix I. The ACTION statements provide the required operating flexibility and at the same time implement the guides set forth in Section IV.A of Appendix I to assure that the release of radioactive material in gaseous effluents will be kept "as low as is reasonably achievable." The Surveillance Requirements implement the requirements in Section III.A of Appendix I that conformance with the guides of Appendix I be shown by calculational procedures based on models and data such that the actual exposure of an individual through the appropriate pathways is unlikely to be substantially underestimated. The dose calculations established in procedure 1/2-ODC-2.02 for calculating the doses due to the actual release rates of radioactive noble gases in gaseous effluents are consistent with the methodology provided in Regulatory Guide 1.109, and Regulatory Guide 1.111. The equations in procedure 1/2-ODC-2.02 are provided for determining the air doses at the exclusion area boundary, and are based upon the historical average atmospheric conditions. NUREG-0133 provides methods for dose calculations consistent with Regulatory Guides 1.109 and 1.111. This specifications applies to the release of gaseous effluents from Beaver Valley Power Station, Unit No. 1 or Unit No. 2.^(3.1.2, 3.2.2, 3.2.5, 3.2.6, 3.2.8)

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# ATTACHMENT C

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## BASES FOR ODCM CONTROLS: GASEOUS EFFLUENTS

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Title:

#### DOSE, RADIOIODINES, RADIOACTIVE MATERIAL IN PARTICULATE FORM AND RADIONUCLIDES OTHER THAN NOBLE GASES

This CONTROL is provided to implement the requirements of Sections II.C, III.A, and IV.A of Appendix I, 10 CFR Part 50. The CONTROLS are the guides set forth in Section II.C of Appendix I.^(3.2.2)

The ACTION statements provide the required operating flexibility and at the same time implement the guides set forth in Section IV.A of Appendix I to assure that the releases of radioactive materials in gaseous effluents will be kept "as low as is reasonably achievable." The calculational methods specified in the surveillance requirements implement the requirements in Section III.A of Appendix I that conformance with the guides of Appendix I be shown by calculational procedures based on models and data such that the actual exposure of an individual through appropriate pathways is unlikely to be substantially underestimated. The calculational methods in procedure 1/2-ODC-2.02 are for calculating the doses due to the actual release rates of the subject materials are consistent with the methodology provided in Regulatory Guide 1.109, and Regulatory Guide 1.111. These equations also provide for determining the actual doses based upon the historical average atmospheric conditions. The release rate specifications for radioiodines, radioactive material in particulate form, and radionuclides other than noble gases are dependent on the existing radionuclide pathways to man, in the unrestricted area. The pathways which are examined in the development of these calculations are: 1) individual inhalation of airborne radionuclides, 2) deposition of radionuclides onto vegetation with subsequent consumption by man, 3) deposition onto grassy areas where milk animals and meat producing animals graze with consumption of the milk and meat by man, and 4) deposition on the ground with subsequent exposure of man. This CONTROL applies to radioactive material in particulate form and radionuclides other than noble gases released from Beaver Valley Power Station, Unit No. 1 or Unit No.2.^{(3.1.2, 3.2.2,} 3.2.6, 3.2.7)

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## BASES FOR ODCM CONTROLS: GASEOUS EFFLUENTS

#### 3/4.11.2.4 GASEOUS RADWASTE TREATMENT SYSTEM

The CONTROL that the appropriate portions of these systems be used when specified provides reasonable assurance that the releases of radioactive materials in gaseous effluents will be kept "as low as is reasonably achievable." This specification implements the requirements of 10 CFR Part 50.36a, General Design Criterion 60 of Appendix A to 10 CFR Part 50, and design objective Section II.D of Appendix I to 10 CFR Part 50. The specified limits governing the use of appropriate portions of the systems were specified as a suitable fraction of the dose design objectives set forth in Sections II.B and II.C of Appendix I, 10 CFR Part 50, for gaseous effluents. This specification applies to gaseous radwaste from Beaver Valley Power Station, Unit No. 1 or Unit No. 2.^(3.1.2, 3.2.2)

## 3/4.11.2.5 BV-1 GASEOUS WASTE STORAGE TANKS

Restricting the quantity of radioactivity contained in each gas storage tank provides assurance that in the event of an uncontrolled release of the tanks' contents, the resulting total body exposure to an individual located at the nearest exclusion area boundary for two hours immediately following the onset of the release will not exceed 0.5 rem. The specified limit restricting the quantity of radioactivity contained in each gas storage tank was specified to ensure that the total body exposure resulting from the postulated release remained a suitable fraction of the reference value set forth in 10 CFR 100.11 (a)(1).

## 3/4.11.2.5 BV-2 GASEOUS WASTE STORAGE TANKS

Restricting the quantity of radioactivity contained in any connected group of gaseous waste storage tanks provides assurance that in the event of an uncontrolled release of the tanks' contents, the resulting total body exposure to an individual located at the nearest exclusion area boundary for two hours immediately following the onset of the release will not exceed 0.5 rem. The specified limit restricting the quantity of radioactivity contained in any connected group of gaseous waste storage tanks was specified to ensure that the total body exposure resulting from the postulated release remained a suitable fraction of the reference value set forth in 10 CFR 100.11(a)(1). The curie content limit is applied individually to each gaseous waste storage tank and collectively to the number of unisolated gaseous waste storage tanks.

**ODCM:** Bases For ODCM Controls

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# ATTACHMENT D Page 1 of 1 BASES FOR ODCM CONTROLS: TOTAL DOSE

## 3/4.11.4 <u>TOTAL DOSE</u>

This CONTROL is provided to meet the dose limitations of 40 CFR Part 190 that have been incorporated into 10 CFR Part 20 by 46 FR 18525. The CONTROL requires the preparation and submittal of a Special Report whenever the calculated doses due to releases of radioactivity and to radiation from uranium fuel cycle sources exceed 25 mrems to the whole body or any organ, except the thyroid, which shall be limited to less than or equal to 75 mrems. For sites containing up to 4 reactors, it is highly unlikely that the resultant dose to a MEMBER OF THE PUBLIC will exceed the dose limits of 40 CFR Part 190 if the individual reactors remain within twice the dose design objectives of Appendix I, and if direct radiation doses from the units (including outside storages tanks, etc.) are kept small. The Special Report will describe a course of action that should result in the limitation of the annual dose to a MEMBER OF THE PUBLIC to within the 40 CFR Part 190 limits. For the purposes of the Special Report, it may be assumed that the dose commitment to the MEMBER OF THE PUBLIC from other uranium fuel cycle sources is negligible, with the exception that dose contributions from other nuclear fuel cycle facilities at the same site or within a radius of 5 miles must be considered. If the dose to any MEMBER OF THE PUBLIC is estimated to exceed the requirements of 40 CFR Part 190, the Special Report with a request for a variance (provided the release conditions resulting in violation of 40 CFR Part 190 have not already been corrected), in accordance with the provisions of 40 CFR 190.11 and 10 CFR 20.405c, is considered to be a timely request and fulfills the requirements of 40 CFR Part 190 until NRC staff action is completed. The variance only relates to the limits of 40 CFR Part 190, and does not apply in any way to the other requirements for dose limitation of 10 CFR Part 20, as addressed in ODCM CONTROL 3.11.1.1 and 3.11.2.1. An individual is not considered a MEMBER OF THE PUBLIC during any period in which he/she is engaged in carrying out any operation that is part of the nuclear fuel cycle.^(3.1.3, 3.2.1, 3.2.2, 3.2.4)

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, . <u>.</u>	ATTACHMENT E	· · ·	
BASE	Page 1 of 1 S FOR ODCM CONTROLS: RADIOLOGICAL EN PROGRAM (REMP)	VIRONMENTAI	L MONITORING
3/4.12.1	MONITORING PROGRAM		
	<ul> <li>The radiological monitoring program required by measurements of radiation and of radioactive mat for those radionuclides which lead to the highest</li> <li>MEMBER(S) OF THE PUBLIC resulting from the program thereby supplements the radiological effective for the measurable concentrations of radioactive not higher than expected on the basis of the efflue environmental exposure pathways. The initially effective for at least the first 3 years of commerci program changes may be initiated based on operation. The detection capabilities required by ODCM Contenant for routine environmental measurements in for drinking water meet the requirements of 40 C</li> </ul>	terials in those ex potential radiatio he station operation fluent monitoring materials and leve ent measurements specified monitor ial operation. Following ational experience ontrol 3.12.1, Tab n industrial labor	posure pathways and n exposures of on. This monitoring program by verifying vels of radiation are s and modeling of the ing program will be lowing this period, e. le 4.12-1 are state-of-
3/4.12.2	LAND USE CENSUS ODCM CONTROL 3.12.2 is provided to ensure areas are identified and that modifications to the required by the results of this census. The best su door survey, aerial survey, or by consulting with used. This census satisfies the requirements of S Part 50. Restricting the census to gardens of grea assurance that significant exposure pathways via monitored since a garden of this size is the minin (26 kg/year) of leafy vegetables assumed in Regu a child. To determine this minimum garden size, used: 1) that 20% of the garden was used for gro to lettuce and cabbage), and 2) a vegetation yield	monitoring progra urvey information local agriculture a ection IV.B.3 of a ater than 500 squa leafy vegetables num required to p latory Guide 1.10 , the following as wing broad leaf v	ams are made if from the door-to- authorities shall be Appendix I to 10 CFR are feet provides will be identified and roduce the quantity 99 for consumption by sumptions were regetation (i.e., similar
3/4.12.3	INTERLABORATORY COMPARISON PROG	RAM	
	The ODCM CONTROL 3.12.3 for participation is Program is provided to ensure that independent c the measurements of radioactive material in envir performed as part of a quality assurance program to demonstrate that the results are reasonably valid	hecks on the prec ronmental sample for environmenta	ision and accuracy of matrices are

**Unit 1/2** 

# 1/2-ODC-3.03

**ODCM:** Controls for RETS and REMP Programs

# Document Owner Manager, Nuclear Environmental and Chemistry

Revision Number	· · · ·	4
Level Of Use		General Skill Reference
Safety Related Procedure		Yes

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	Unit: 1/2	Level Of Use:
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ATTACHMENT T ODCM CONTROLS: ANNUAL REMP REPOR ATTACHMENT U ODCM CONTROLS: ANNUAL RETS REPOR		

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#### 1.0 <u>PURPOSE</u>

- 1.1 This procedure includes selected Definitions and Tables as delineated in Section 1 of the Technical Specifications and selected Applicability and Surveillance Requirement statements as delineated in Section 3/4 of the Technical Specifications.
  - 1.1.1 Prior to issuance of this procedure, these items were located in Appendix C of the old ODCM, and were added to this procedure for reference purposes, even though they are currently described in the Technical Specifications.
- 1.2 This procedure contains the controls for the Radiological Effluent Technical Specification (RETS) that were transferred from the Technical Specifications per Unit 1/2 Amendments 1A-188/2A-70, and in accordance with Generic Letter 89-01 and NUREG-1301.^(3.2.10)

1.2.1 Prior to issuance of this procedure, these items were located in Appendix C of the old ODCM.

- 1.3 This procedure contains the reporting requirements for the Annual Radioactive Effluent Release Report and the Annual Radiological Environmental Report that were transferred from the Technical Specifications per Unit 1/2 Amendments 1A-188/2A-70 and in accordance with Generic Letter 89-01 and NUREG-1301.^(3.2.10)
  - 1.3.1 Prior to issuance of this procedure, these items were located in Appendix E of the old ODCM.
- 1.4 This procedure contains the controls for Radiation Monitoring Instrumentation that were transferred from the Technical Specification per Unit 1/2 Amendments 246/124, and in accordance with NUREG-1431.^(3.2.11)
- 1.5 This procedure contains the controls for Liquid Holdup Tank Activity Limits and for Gas Decay/Storage Tank Activity Limits that were transferred from the Technical Specification per Unit 1/2 Amendment 250/130, and in accordance with NUREG-1431.^(3.1.6, 3.2.11)

#### 2.0 <u>SCOPE</u>

2.1 This procedure is applicable to all station personnel that are qualified to perform activities as described and referenced in this procedure.

#### 3.0 <u>REFERENCES AND COMMITMENTS</u>

#### 3.1 <u>References</u>

- 3.1.1 1/2-ODC-2.01, ODCM: Liquid Effluents
- 3.1.2 1/2-ODC-2.02, ODCM: Gaseous Effluents
- 3.1.3 1/2-ODC-3.02, ODCM: Bases for ODCM Controls

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3.1.4	Unit 1/2 Technical Specification 6.8.6, including Ame 175/2A-137) Implemented August 7, 1995.	endments 188/7	
3.1.5	Unit 1/2 Technical Specification 3.3.3.1, including Ar 287/2A-159) Implemented April 11, 2002	nendments 246	5/142 (LAR 1A-
3.1.6	Unit 1/2 Technical Specification 3.11.1.4, 3.11.2.5, 6. Amendments 250/130 (LAR 1A-291/2A-163) Implem		-
3.1.7	1/2-ADM-1640, Control of the Offsite Dose Calculati	on Manual	
3.1.8	1/2-ADM-0100, Procedure Writer's Guide		•
3.1.9	NOP-SS-3001, Procedure Review and Approval	an an taon ta	
3.1.10	CR 981489, ODCM Table 4.11-2 Row A (Waste Gas Storage Tank Discharge). CA-01, Revise Appendix C of the ODCM (Table 4.11-2) to add clarification as to where and when tritium samples are to be obtained for GWST discharges.		
3.1.11	CR 981490, ODCM Table 4.11-2 Note e, and Related Procedures. CA-01, Revise Appendix C of the ODCM the proper tritium sample point.	· · ·	
3.1.12	CR 993021, Apparent failure to test RM-1DA-100 trip No ODCM changes are required for this CR.	o function as rea	quired by ODCM.
3.1.13	CR 001682, ODCM Action 28 Guidance. CA-02, Revise Appendix C of the ODCM (Table 3.3-13, Action 28) to differentiate actions associated with Inoperable Process Flow Rate Monitors vs. Sample Flow Rate Monitors.		
3.1.14	CR02-05711, TS and ODCM changes not reflected in 10M.54.3.L5 Surveillance Log. CA-01, Revise 1/2-ODC-3.03 to add a requirement for applicable station groups notification of pending ODCM changes.		
3.1.15	CR03-06123, Enhance Table 3.3-6 of 1/2-ODC-3.03 t		
	Monitoring. CA-01, Revise Table 3.3-6 and Table 4.3 Channel 5 as an additional 2 nd PMM when the Unit 1 Effluent Monitors are Inoperable.		
3.1.16	CR03-06281, Gaseous Tritium Sampling Required by for Chemistry. CA-01, Revise procedure Attachment Chemistry sampling of Gaseous Effluent Pathways to need sampled for compliance to ODCM Control 3.11.	K Table 4.11-2 show which eff	for RP & fluent pathways
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3.1.17	· · · · · · · · · · · · · · · · · · ·	07 to clarify the t RP 15.7.3. CA-0	term "Surface Water 5, Revise 1/2-
3.1.18		Programs VS Pa cedure Attachmer	apers Presented at ant K Table 4.11-2 to
3.1.19	CR03-09288, LAR 1A-321 & 2A-193, Increased Fle Review LAR 1A-321/2A-193 to identify the affected manuals, and applicable plant modification documen support implementing the LAR.	l Rad Effluent pr	rocedures, programs,
3.1.20	CR03-09959, RFA-Rad Protection Provide Clarificat Sample. CA-01, Revise ODCM procedure 1/2-ODC note c & note e) to allow sampling of the appropriate	C-3.03 Attachmen	nt K (Table 4.11-2
3.1.21	CR03-11726, Typographical Error Found in ODCM procedure 1/2-ODC-3.03, Attachment O, Control 3.1 error. Specifically, the final word in Action (a) needs	1.2.5 to correct a	a typographical
3.1.22	CR04-01643, Procedure Correction – Typographical Revise ODCM procedure 1/2-ODC-3.03, Attachment correct a typographical error. Specifically, the Asset used for measurement of sample flow (from the Alter changed from [PI-1GW-13] to [PI-1GW-135].	t F, (Table 3.3-1 Number for the	3 and 4.3-13) to Vacuum Gauge
3.1.23	CR04-02275, Discrepancies in Table 3.3-13 of the O procedure 1/2-ODC-3.03, Attachment F, (Table 3.3-1 that the "Sampler Flow Rate Monitors are the devices Sampling".	13 and 4.3-13) to	o add clarification
3.1.24	Unit 1 Technical Specification Amendment No. 275 No. DPR-66. This amendment to the Unit 1 license v July 19, 2006.	• •	
3.1.25	Vendor Calculation Package No. 8700-UR(B)-223, In Conversion, Power Uprate, and Alternative Source T Radiation Monitors at Unit 1.		-
3.1.26	Engineering Change Package No. ECP-04-0440, Exte	ended Power Up	orate.
3.1.27	CR 06-04908, Radiation Monitor Alarm Setpoint Dis procedure 1/2-ODC-3.03 to update the alarm setpoint [RM-1GW-109] for incorporation of the Extended Po Amendment No. 275.	ts of [RM-1VS-1	110] and

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3.2.1	10 CFR Part 20, Standards for Protection Against Ra	diation		
3.2.2	10 CFR Part 50, Domestic Licensing of Production a	nd Utilization F	acilities	
3.2.3	40 CFR Part 141			
3.2.4	40 CFR Part 190, Environmental Radiation Protectio Operations.	n Standards For	Nuclear Power	
3.2.5	Regulatory Guide 1.109, Calculation Of Annual Dos Of Reactor Effluents For The Purpose Of Evaluating Appendix I, Revision 1, October 1977			
3.2.6	Regulatory Guide 1.111, Methods For Estimating Att Dispersion Of Gaseous Eflfuents In Routine Releases Reactors, Revision 1, July 1977	-	-	
3.2.7	Regulatory Guide 1.113, Estimating Aquatic Dispers And Routine Reactor Releases For The Purpose Of In 1977			
3.2.8	NUREG-0133, Preparation of Radiological Effluent Nuclear Power Plants, October 1978	Fechnical Specif	fications for	
3.2.9	NUREG-0737, Clarification of TMI Action Plan Req	uirements, Octo	ber 1980	
3.2.10	NUREG-1301, Offsite Dose Calculation Manual Gui Effluent Controls For Pressurized Water Reactors (G No. 1)	-	. •	
3.2.11	NUREG-1431, Standard Technical Specifications - V	Vestinghouse Pla	ants Specifications	
3.2.12	NUREG-0800, Standard Review Plan, Postulated Ra Containing Tank Failures, July 1981	dioactive Releas	es Due to Liquid-	
3.2.13	Licensee Response to NRC Unresolved Item 50-334/ Particle Distribution Evaluation showed that the Lice correction factors to determine particulate activity in	nsee must contin	nue to use	

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# 4.0 RECORDS AND FORMS

#### 4.1 <u>Records</u>

4.1.1 Any calculation supporting ODCM changes shall be documented, as appropriate, by a retrievable document (e.g.; letter or calculation package) with an appropriate RTL number.

#### 4.2 <u>Forms</u>

4.2.1 None

## 5.0 PRECAUTIONS AND LIMITATIONS

- 5.1 The numbering of each specific ODCM Control, ODCM Surveillance Requirement and ODCM Table contained in this procedure does not appear to be sequential. This is intentional, as all ODCM Control, ODCM Surveillance Requirement and ODCM Table numbers remained the same when they were transferred from the Technical Specifications. This was done in an effort to minimize the amount of plant procedure changes and to eliminate any confusion associated with numbering changes.
- 5.2 The numbering of each specific ODCM Report contained in this procedure does not appear to be sequential. This is intentional, as all ODCM Report numbers remained the same when they were transferred from the Technical Specifications. This was done in an effort to minimize the amount of plant procedure changes and to eliminate any confusion associated with numbering changes.

# 6.0 <u>ACCEPTANCE CRITERIA</u>

- 6.1 Any change to this procedure shall contain sufficient justification that the charge will maintain the level of radioactive effluent control required by 10 CFR 20.1302, 40 CFR Part 190, 10 CFR 50.36a, and Appendix I to 10 CFR 50, and not adversely impact the accuracy or reliability of effluent dose or setpoint calculation.^(3.2.10)
  - 6.1.1 All changes to this procedure shall be prepared in accordance with 1/2-ADM-0100^(3.1.8) and 1/2-ADM-1640.^(3.1.7)
  - 6.1.2 Pending changes to this procedure shall be provided to applicable station groups. For example, <u>IF</u> Control 3.11.1.1 is being changed, <u>THEN</u> the proposed changes shall be provided to the applicable station groups (i.e.; owner of the procedures), identified in the MATRIX of ODCM procedure 1/2-ODC-1.01. This will allow the station groups to revise any affected procedures concurrent with the ODCM change.^(3.1.14)
  - 6.1.3 All changes to this procedure shall be reviewed and approved in accordance with NOP-SS-3001 ^(3.1.9) and 1/2-ADM-1640.^(3.1.7)

#### 7.0 PREREQUISITES

7.1 The user of this procedure shall be familiar with ODCM structure and content.

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#### 8.0 **PROCEDURE**

- 8.1 See ATTACHMENT A for a Table of Operational Modes and a Table of Frequency Notation.
- 8.2 See ATTACHMENT B for a list of defined terms used throughout the ODCM.
- 8.3 See ATTACHMENT C thru ATTACHMENT S for a complete description of all ODCM Controls.
- 8.4 See ATTACHMENT T for a description of the Annual Report required by the REMP Controls.
- 8.5 See ATTACHMENT U for a description of the Annual Report required by the RETS Controls.

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ODCM CO		TTACHMENT A Page 1 of 2 DNAL MODES AND FRE	QUENCY	NOTATION
		TABLE 1.1		
	OPE	ERATIONAL MODES		
MODE	REACTIVITY CONDITION, K _{eff}	% RATED THERMAL POWER ⁽¹⁾		AGE COOLANT MPERATURE
1. Power Operation	≥0.99	>5%		≥350°F
2. Startup	≥0.99	≤5%		≥350°F
3. Hot Standby	<0.99	0		≥350°F
4. Hot Shutdown	<0.99	0		350°F >T _{avg} >200°F
5. Cold Shutdown	<0.99	0;		≤200°F
6. Refueling ⁽²⁾	≤0.95	0	-	≤140°F
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<u>,                                    </u>				

(1) (2) Excluding decay heat. Reactor vessel head unbolted or removed and fuel in the vessel.

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ute: DCM: Controls for RETS and	REMP Programs	Unit: <u>1/2</u> Revision: <u>4</u>	Level Of Use: General Skill Refer Page Number: 10 of 79	ence		
ODCM CONTROLS: (	ATTACHMENT A Page 2 of 2 OPERATIONAL MODES AND FREG	<b>1</b>				
	<b>TABLE 1.2</b>					
	FREQUENCY NOTATION			)		
<b>NOTATION</b>	FREQUENCY			5 1		
salas substanting and an anna substanting an anna substanting an anna substanting an anna substanting an anna s Anna anna anna anna anna anna anna anna	At least once per 12 hours		·	i		
D	At least once per 24 hours					
W	At least once per 7 days			,		
М	At least once per 31 days					
Q	At least once per 92 days					
SA	At least once per 184 days					
R	At least once per 18 months			ç •		
S/U	Prior to each reactor startup					
Р	Completed prior to each release					
N.A.	Not applicable					

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# ATTACHMENT B Page 1 of 3 ODCM CONTROLS: DEFINITIONS

The defined terms of this section appear in capitalized type and are applicable throughout these CONTROLS.

<u>ACTION</u> shall be those additional requirements specified as corollary statements to each principal CONTROL and shall be part of the CONTROLS.

<u>CHANNEL CALIBRATION</u> shall be the adjustment, as necessary, of the channel output such that it responds with the necessary range and accuracy to known values of the parameter which the channel monitors. The CHANNEL CALIBRATION shall encompass the entire channel including the sensor and alarm and/or trip functions, and shall include the CHANNEL FUNCTIONAL TEST. The CHANNEL CALIBRATION may be performed by any series of sequential, overlapping, or total channel steps such that the entire channel is calibrated.

<u>CHANNEL CHECK</u> shall be the qualitative assessment of channel behavior during operation by observation. This determination shall include, where possible, comparison of the channel indication and/or status with other indications and/or status derived from independent instrument channels measuring the same parameter.

<u>CHANNEL FUNCTIONAL TEST</u> shall be the injection of a simulated signal into the channel as close to the primary sensor as practicable to verify OPERABILITY including alarm and/or trip functions.

<u>FREQUENCY NOTATION</u> specified for the performance of Surveillance Requirements shall correspond to the intervals defined in Table 1.2.

<u>GASEOUS RADWASTE TREATMENT SYSTEM</u> is any system designed and installed to reduce radioactive gaseous effluents by collecting primary coolant system offgases from the primary system and providing for delay or holdup for the purpose of reducing the total radioactivity prior to release to the environment.

<u>MEMBER(S) OF THE PUBLIC (10 CFR 20 and/or 10 CFR 50)</u> means any individual except when that individual is receiving an occupational dose. This definition is used to show compliance to ODCM CONTROL 3.11.1.1, 3.11.1.4, 3.11.2.1 and 3.11.2.5 that are based on 10 CFR Part 20. This definition is also used to show compliance to ODCM Controls 3.11.1.2, 3.11.1.3, 3.11.2.2, 3.11.2.3 and 3.11.2.4 that are based on 10 CFR Part 50.

<u>MEMBER(S) OF THE PUBLIC (40 CFR 190)</u> means any individual that can receive a radiation dose in the general environment, whether he may or may not also be exposed to radiation in an occupation associated with a nuclear fuel cycle. However, an individual is not considered a MEMBER OF THE PUBLIC during any period in which he is engaged in carrying out any operation which is part of the nuclear fuel cycle. This definition is used to show compliance to an ODCM CONTROL 3.11.4.1 that is based on 40 CFR Part 190.

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## ATTACHMENT B Page 2 of 3 ODCM CONTROLS: DEFINITIONS

<u>OFFSITE DOSE CALCULATION MANUAL</u> (ODCM) shall contain the methodology and parameters used in the calculation of offsite doses resulting from radioactive gaseous and liquid effluents, in the calculation of gaseous and liquid effluent monitoring Alarm/Trip Setpoints, and in the conduct of the Environmental Radiological Monitoring Program. The ODCM shall also contain (1) the Radioactive Effluent Controls and Radiological Environmental Monitoring Programs required by Technical Specification (TS) Section 6.8.6 and (2) descriptions of the information that should be included in the Annual Radiological Environmental Operating and Annual Radioactive Effluent Release Reports that are also required by the Administrative Controls Section of the TS

<u>OPERABLE/OPERABILITY</u> A system, subsystem, train, component, or device shall be <u>OPERABLE</u> or have <u>OPERABILITY</u> when it is capable of performing its specified function(s). Implicit in this definition shall be the assumption that all necessary attendant instrumentation, controls, normal and emergency electric power sources, cooling or seal water, lubrication or other auxiliary equipment that are required for the system, subsystem, train, component, or device to perform its function(s) are also capable of performing their related safety function(s).

<u>OPERATIONAL MODE</u> shall correspond to any one inclusive combination of core reactivity condition, power level, and average reactor coolant temperature specified in ATTACHMENT A Table 1.1.

<u>PURGE</u> or <u>PURGING</u> is the controlled process of discharging air or gas from a confinement to maintain temperature, pressure, humidity, concentration, or other operating conditions, in such a manner that replacement air or gas is required to purify the confinement.

<u>RATED THERMAL POWER</u> shall be a total reactor core heat transfer rate to the reactor coolant of 2689 MWt.

<u>REPORTABLE EVENT</u> shall be any of those conditions specified in Section 50.73 to 10 CFR Part 50.

SHUTDOWN means reactor power change to 0% power.

<u>SITE BOUNDARY</u> shall be that line beyond which the land is neither owned, nor leased, nor otherwise controlled by the licensee. The Figure for Liquid Effluent Site Boundary is contained in 1/2-ODC-2.01. The Figure for Gaseous Effluent Site Boundary is contained in 1/2-ODC-2.02.

STARTUP means reactor power change from 0% power.

<u>SOURCE CHECK</u> shall be the qualitative assessment of channel response when the channel sensor is exposed to a radioactive source.

THERMAL POWER shall be the total reactor core heat transfer rate to the reactor coolant.

<u>UNRESTRICTED AREA</u> means any area access to which is neither limited nor controlled by the licensee.

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A TT A CUMENIT D					

#### ATTACHMENT B Page 3 of 3 ODCM CONTROLS: DEFINITIONS

<u>VENTILATION EXHAUST TREATMENT SYSTEM</u> is any system designed and installed to reduce gaseous radioiodine or radioactive material in particulate form in effluents by passing ventilation or vent exhaust gases through charcoal absorbers and/or HEPA filters for the purpose of removing iodines or particulates from the gaseous exhaust stream prior to the release to the environment (such a system is not considered to have any effect on noble gas effluents). Engineered Safety Feature (ESF) atmospheric cleanup systems are not considered to be VENTILATION EXHAUST TREATMENT SYSTEM components.

<u>VENTING</u> is the controlled process of discharging air or gas from a confinement to maintain temperature, pressure, humidity, concentration or other operating conditions, in such a manner that replacement air or gas is not provided or required during VENTING. Vent, used in system names, does not imply a VENTING process.

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	Beaver Valley Power Station	Procedure Number: 1/2-ODC-3.03				
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OD	CM CONTROLS: APPLICABILITY AND SURVEILLA	ANCE REQU	JIREMENTS			
CONTRACT			· · · ·			
CONTROL	S: APPLICABILITY	:	2 · · · · · · · · · · · · · · · · · · ·			
201 Cor	nuliance with the ODCM CONTROLS in the guaranding	ODCMCON	TROLS is required			
	npliance with the ODCM CONTROLS in the succeeding					
	ing the OPERATIONAL MODES or other conditions spec					
	ure to meet the ODCM CONTROL, the associated ODCM	I ACTION I	equirements shall be			
met	, except as provided in ODCM CONTROL 3.0.6.					
202 Mar	a compliance with a ODCM CONTROL shall evict when	the require	onto of the ODCM			
	n-compliance with a ODCM CONTROL shall exist when the NTROL and according to ACTION requirements on					
	NTROL and associated ODCM ACTION requirements are		-			
	rvals. If the ODCM CONTROL is restored prior to expira		pecified time interval			
com	pletion of the ODCM ACTION requirements is not require	red.				
202 11/1		41				
	en a ODCM CONTROL is not met (except as provided in					
-	irements) within one hour, action shall be initiated to place		a MODE in which th			
OD	CM CONTROL does not apply by placing it, as applicable	e, in:				
1.	At least HOT STANDBY within the next 6 hours,					
	At least HOT SHANDBT within the following 6 ho	una and	,			
2.		•				
3.	At least COLD SHUTDOWN within the subsequent 2	4 nours.				
Wh	ere corrective measures are completed that permit operation	on under the	ODCM ACTION			
	irements, the ODCM ACTION may be taken in accordan					
-	•		-			
	sured from the time of failure to meet the ODCM CONTROLS		tions to these			
	irements are stated in the individual ODCM CONTROLS	<b>)</b> .				
icqi	on on ODCM CONTROL is not mot ontar into an ODED					
	21 ALEVEN VEN ENDER OF AS DOF MEL CHEVEN OF AN VERAN	A HUNAL №	IODE or specified			
3.0.4 Whe	en an ODCM CONTROL is not met, entry into an OPERA dition in the Applicability shall only be made:	ATIONAL M	IODE or specified			
3.0.4 Whe	dition in the Applicability shall only be made:	ATIONAL M	IODE or specified			
3.0.4 Who	dition in the Applicability shall only be made:		·			
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3.0.4 Whe cone a.	dition in the Applicability shall only be made: When the associated ODCM ACTIONS to be entered perr OPERATIONAL MODE or other specified condition in th	mit continue	d operation in the			
3.0.4 Whe cone a.	dition in the Applicability shall only be made: When the associated ODCM ACTIONS to be entered per	mit continue	d operation in the			
3.0.4 Who cone a.	dition in the Applicability shall only be made: When the associated ODCM ACTIONS to be entered perr OPERATIONAL MODE or other specified condition in th	mit continue he Applicabi	d operation in the lity for an unlimited			
3.0.4 Whe cone a.	dition in the Applicability shall only be made: When the associated ODCM ACTIONS to be entered perr OPERATIONAL MODE or other specified condition in the period of time, or After performance of a risk assessment addressing inoperation	mit continued he Applicabi able systems	d operation in the lity for an unlimited and components,			
3.0.4 Whe cond a.	dition in the Applicability shall only be made: When the associated ODCM ACTIONS to be entered perr OPERATIONAL MODE or other specified condition in the period of time, or After performance of a risk assessment addressing inoperation consideration of the results, determination of the acceptab	mit continue he Applicabi able systems ility of enter	d operation in the lity for an unlimited and components, ing the			
3.0.4 Who cond a. b.	dition in the Applicability shall only be made: When the associated ODCM ACTIONS to be entered perr OPERATIONAL MODE or other specified condition in the period of time, or After performance of a risk assessment addressing inopera consideration of the results, determination of the acceptab OPERATIONAL MODE or other specified condition in the	mit continue he Applicabi able systems ility of enter he Applicabi	d operation in the lity for an unlimited and components, ing the lity, and establishmen			
3.0.4 Whe cond a. b.	dition in the Applicability shall only be made: When the associated ODCM ACTIONS to be entered perr OPERATIONAL MODE or other specified condition in the period of time, or After performance of a risk assessment addressing inoperations consideration of the results, determination of the acceptab OPERATIONAL MODE or other specified condition in the of risk management actions, if appropriate; exceptions to the	mit continue he Applicabi able systems ility of enter he Applicabi	d operation in the lity for an unlimited and components, ing the lity, and establishmen			
3.0.4 Whe cond a. b.	dition in the Applicability shall only be made: When the associated ODCM ACTIONS to be entered perr OPERATIONAL MODE or other specified condition in the period of time, or After performance of a risk assessment addressing inopera consideration of the results, determination of the acceptab OPERATIONAL MODE or other specified condition in the	mit continue he Applicabi able systems ility of enter he Applicabi	d operation in the lity for an unlimited and components, ing the lity, and establishmen			
3.0.4 Whe cond a. b.	dition in the Applicability shall only be made: When the associated ODCM ACTIONS to be entered perr OPERATIONAL MODE or other specified condition in the period of time, or After performance of a risk assessment addressing inoperations consideration of the results, determination of the acceptab OPERATIONAL MODE or other specified condition in the of risk management actions, if appropriate; exceptions to the	mit continued he Applicabi able systems ility of enter he Applicabi this ODCM (	d operation in the lity for an unlimited and components, ing the lity, and establishmen CONTROL are stated			

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ODCM	I: Con	trols for	RETS and	I REMP Pro	ograms		Revisi	on: 1	Page Nun	nber: 15 of 79	
				·	ATTACH	MENT C			<b>.</b>		
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	ODC	CON CON	TROLS:	APPLICAE	BILITY A	ND SURVEIL	LANCE F	EQU	IREME	NTS	
	speci	fied con	ditions in t		bility that	nanges in OPE are required to					S o
3.0.5	becau inope its ap emerg train( specifi initiat	ise its ef rable, it plicable gency po s), comp fication. ted to pl	mergency p may be co ODCM C ower sourc ponent(s) a Unless be	oower source onsidered O ontrol for O e is OPERA and device(so oth condition it in a MOD	e is inope PERABL Operation, ABLE; and are OPE ons (1) and	t or device is d rable, or solely E for the purpe provided; (1) d (2) all of its r RABLE, or lil d (2) are satisfi th the applicab	y because ose of satis its corresp redundant kewise sat ed within	ts noi fying ondin syster isfy th 2 hou	mal por the requ g norma n(s), sul ne requir rs, actio	wer sourd uirements al or bsystem( rements o on shall b	ce i s of s), of t e
	1. 2. 3. This (	At lea At lea	ist HOT SI ist COLD S	HUTDOWN SHUTDOW	N within th N within	next 6 hours, ne following 6 the subsequen MODES 5 or	t 24 hours				
3.0.6	be ret demo to OI	urned to nstrate i DCM CO	o service u its OPERA ONTROL 3	nder admin BILITY or 3.0.1 for the	istrative c the OPEF system re	inoperable to ontrol solely to ABILITY of o eturned to serv OPERABILITY	o perform other equij	testing oment	g require This i	ed to s an exce	epti
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	ODCM CONTROLS: APPLICABILITY AND SURVEILLA	ANCE REO	LIREMENTS			
			·			
CONT	ROLS: SURVEILLANCE REQUIREMENTS					
			······································			
4.0.1	Surveillance Requirements shall be met during the OPERATE specified for individual ODCM CONTROLS unless otherwise Surveillance Requirement. Failure to meet a ODCM Surveill experienced during the performance of the Surveillance or be Surveillance, shall be failure to meet the ODCM CONTROL. within the allowed surveillance interval, defined by ODCM S shall be failure to meet the ODCM CONTROL except as pro- Requirement 4.0.3. Surveillances do not have to be performed variables outside specified limits.	e stated in a lance, wheth tween perfo Failure to Surveillance vided in OD	n individual ODCM er such failure is rmance of the perform a Surveillance Requirement 4.0.2, CM Surveillance			
4.0.2	Each ODCM Surveillance Requirement shall be performed w with a maximum allowable extension not to exceed 25% of the	-				
4.0.3	If it is discovered that a ODCM Surveillance was not perform surveillance interval (defined by ODCM Surveillance Require the requirement to declare the ODCM CONTROL not met ma discovery, up to 24 hours or up to the limit of the specified su greater. This delay period is permitted to allow performance evaluation shall be performed for any ODCM Surveillance de risk impact shall be managed.	ement 4.0.2) ay be delaye rveillance ir of the ODC	, then compliance with d, from the time of nterval, whichever is M Surveillance. A risk			
	If the ODCM Surveillance is not performed within the delay p must immediately be declared not met, and the applicable OD	•				
	When a ODCM Surveillance is performed within the delay pe					
	not met, the ODCM CONTROL must immediately be declare ODCM ACTION(s) must be entered.	ed not met, a				

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Beaver Valley Power Station				Procedure Number: 1/2-ODC-3.03			
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	ODCM: Controls for RETS and REMP Programs				4	17 of 79	
		A	TTACHMEN	ΓD			
	ODCM CONT	ROLS: RADIA	Page 1 of 8	ORING INS	STRUMEN	TATION	
CONTROLS	S: RADIATIO	N MONITORIN	IG (HIGH RA)	IGE INSTR	UMENTA	ΓΙΟΝ)	
	····		•		• m 11		
3.3.3.1		n monitoring in E with their alar					
	OI LIADLI		in trip scipolities	within the .	specifica m	ints.	
APPLICABI	LITY: As s	hown in Table 3	.3-6.	.*•		ana shiri te ka <b>ta</b> k	
ACTION:		N.				n dhaigeachteacht a s Airte Anna Airte	
		· .				and the second	
<b>a</b> .						the value shown i	
		trol 3.3.3.1, Tat te channel inope		the setpoin	t to within t	he limit within 4	
		-					
b.				nnels inope	able, take t	he ACTION show	
	ODCM Con	trol 3.3.3.1, Tal	ble 3.3-6.				
<b>C</b> ,	The provisic	ons of ODCM C	ontrol 3.0.3 are	not applica	ble.		
	-		v 				
SURVEILLA	ANCE REQUI	REMENIS					
4.3.3.1		-				strated OPERAB	
	CHANNEL	ance of the CHA FUNCTIONAI DCM Control 3.	L TEST operation	ons during th		at the frequenci	
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Beaver Valley Power Station					Procedure Number: 1/2-ODC-3.03		
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ODCM: Controls for RETS and REMP Programs					General Skill Reference Page Number: 18 of 79		
ODCM CONTRO	LS: RADIA	. •	ORING INST	RUMEN	<b>TATION</b>		
		TABLE 3.3					
		MONITORIN					
Pri = Primary In		-	lanned Metho		-	:	
•	MINIMUM CHANNELS	APPLICABLE			NOMINAL ASUREMENT	:	
<b>INSTRUMENT</b>	<b>OPERABLE</b>		<u>SETPOINT(</u>		<u>RANGE</u>	ACTION	
Noble Gas Effluent Monitors - S	PINGS ⁽⁴⁾					· · · · ·	
a. Reactor Building/SLCRS (CV-	1; Also called	Elevated Releas	e)				
Mid Range Noble Gas	(1)	1, 2, 3, & 4				35	
Pri: (RM-1VS-110 Ch 7) 1st PMM: (RM-1VS-112 SA-10	n		≤ 1660 cmp	) IF	E-3 to $1E+3$ uCi/cc ⁽²⁾	-	
2nd PMM: (RM-1VS-107B, or 1 3rd PMM: Grab Sampling every	10 Ch 5)		· .			• •	
High Range Noble Gas	(1)	1, 2, 3, & 4				35	
Pri: (RM-1VS-110 Ch 9) Ist PMM: (RM-1VS-112 SA-9 2nd PMM: (RM-1VS-107B, or 1	10 Ch 5)	•	NA	11	E-1 to 1E+5 uCi/cc ⁽²⁾	35	
3rd PMM: Grab Sampling every							
b. Auxiliary Building Ventilation	System (VV-	1; Also called Ve	ntilation Vent)				
Mid Range Noble Gas	(1)	1, 2, 3, & 4		· .		35	
Pri: (RM-1VS-109 Ch 7) 1st PMM: (RM-1VS-111 SA-10	n		≤ 1390 cpm	i IE	E-3 to 1E+3 uCi/cc ⁽²⁾		
2nd PMM: (RM-1VS-101B, or 1 3rd PMM: Grab Sampling every	09 Ch 5)				uC1/cc.		
High Range Noble Gas	(1)	1, 2, 3, & 4				35	
Pri: (RM-1VS-109 Ch 9) 1st PMM: (RM-1VS-111 SA-9)			NA	18	E-1 to 1E+5		
2nd PMM: (RM-1VS-101B, or 1					uCi/cc ⁽²⁾		
3rd PMM: Grab Sampling every					•		
c. Gaseous Waste/Process Vent S	ystem (PV-1/2	2)					
Mid Range Noble Gas	(1)	1, 2, 3, & 4				35	
Pri: (RM-1GW-109 Ch 7) 1st PMM: (RM-1GW-110 SA-1	0)		NA	18	E-3 to 1E+3 uCi/cc ⁽³⁾		
2nd PMM: (RM-1GW-108B, or					uCI/CC`		
3rd PMM: Grab Sampling every	,						
High Range Noble Gas	(1)	1, 2, 3, & 4				35	
Pri: (RM-1GW-109 Ch 9)		-	≤ 1.76E+5		E-1 to $1E+5$	•	
1st PMM: (RM-1GW-110 SA-9 2nd PMM: (RM-1GW-108B, or 3rd PMM: Grab Sampling every	109 Ch5)		<u>.</u>		uCi/cc ⁽³⁾		
Instruments or actions shown as l	DMM are the -	renlanned method	e to he wood whe	n the nrime	a inclument in		
inoperable. <u>SINCE</u> the PMM ins						s THEN	

the ODCM Surveillance Requirements do not apply to the PMM. Therefore, the reporting requirement of Action 35b would still apply when inoperability of the primary instrument exceeds 30 days.

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	ODCM CONTR	ULS: RADIA	TION MONITO	ORING INST	KUMENI	ATION		
		TAI	<u> 3.3-6 (Con</u>	tinued)				
	BV-1 F	RADIATION	MONITORING	INSTRUME	NTATIO	V		
					• `			
	Pri – Primary	· ·	PMM = Prepl	lanned Metho				
		MINIMUM				NOMINAL		
	<b>INSTRUMENT</b>	OPERABLE	APPLICABLE MODES	SETPOINT ⁽¹		ASUREMENT RANGE	ΑΟΤΙΟ	
2.	Noble Gas Effluent Steam M			<del></del>				
	Atmospheric Steam Dump		Safety Relief Val	ve Discharge		•		
•••	Pri: (RM-1MS-100A)	(1)	1, 2, 3, & 4	$\leq 50 \text{ cpm}$	1E-1	to 1E+3 uCi/cc	35	
	PMM: (Form 1/2-HPP-4.02.00		-, -, -,	p				
	Pri: (RM-1MS-100B) PMM: (Form 1/2-HPP-4.02.00	(1) )9.F01)	1, 2, 3, & 4	≤ 50 cpm	1E-1 (	to 1E+3 uCi/cc	35	
	Pri: (RM-1MS-100C) PMM: (Form 1/2-HPP-4.02.00	(1) 99.F01)	1, 2, 3, & 4	≤ 50 cpm	1E-1 (	to 1E+3 uCi/cc	35	
b.	Auxiliary Feedwater Pump 1	furbine Exhaust	•					
	Pri: (RM-1MS-101) PMM: (Form 1/2-HPP-4.02.00	(1) 99.F01)	1, 2, 3, & 4	≤ 170 cpm	1E-1 (	to 1E+3 uCi/cc	35	
			-		, 1			
(a)	Instruments or actions shown a <u>SINCE</u> the PMM instruments s							
	Surveillance Requirements do apply when inoperability of the	not apply to the H	MM. Therefore,	the reporting req				
		• . •						
			•			-		
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Beaver Va	llev Powe	er Station		Procedure Nu		,
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ODCM CONTR		Page 4 of 8	ADDIC DIST	DITATIN	TATION	
ODCM CONTR	OLS: KADIA		JKING INST	KUMEN	IATION	
· · · · · ·	TA	BLE 3.3-6 (Con	tinued)			
<u>BV-2</u>	RADIATION	MONITORING	INSTRUME	NTATIO	N	
Pri = Primary	Instruments,	PMM = Prep	lanned Method	l of Mon	itoring ^(a)	
· * ·		- -	an a			
	MINIMUM CHANNELS	APPLICABLE			NOMINAL ASUREMENT	
INSTRUMENT	<u>OPERABLE</u>	MODES	SETPOINT ⁽¹⁾		RANGE	ACTI
1. Noble Gas Effluent Monitors	*	·····	·			·.
a. SLCRS Filtered Pathway (C	V.J. Also called	Floveted Delega	<b>\</b>		£	
A. SLCRS Finered Failway (C Midrange Noble Gas (Xe-13	-	LICYALCU INCICASE	1	-	· · · ·	
Pri: (2HVS-RQ109C)	(1)	1, 2, 3, & 4	NA	1F-4	to 1E+2 µCi/co	35
1st PMM: (2HVS-RQ109D)	(-)	1, 2, 3, 60 1		112 4		,
2nd PMM: (2HVS-RQ109B)						
3rd PMM: Grab Sampling ev	•	•				
<u>High Range Noble Gas (Xe-</u> Pri: <u>(</u> 2HVS-RQ109D)	<u>133)</u> (1)	1, 2, 3, & 4	NA	16 1	to 1E+5 μCi/co	35
1st PMM: (2HVS-RQ109C)		1, 2, 3, 00 T	MA .	112-1		, ,,
2nd PMM: (2HVS-RQ109B)		-				
3rd PMM: Grab Sampling ev	ery 12 hours					
(a) Instruments or actions shown	as DMA and the m	nontonn od medhode		the mained	. instrument is i	nonoral
(a) Instruments or actions shown <u>SINCE</u> the PMM instruments						
Surveillance Requirements do	not apply to the l	PMM. Therefore,	the reporting requ			
apply when inoperability of th	e primary instrum	ient exceeds 30 day	/S.		-	
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<b>2</b> ·						
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1	Beav	er Valle	ey Powe	er Statio	n		Procedure		-ODC-3.03	
Title:			•••••••••••••••••••••••••••••••••••••••				Unit: 1/2	L	evel Of Use: General Skill R	lefe
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			. A	TTACHM Page 5 o		)		•		
.(	DDCM	CONTROI	LS: RADIA	÷		RING INS	STRUME	ENTA	TION	
			<u>TA</u>	<u>BLE 3.3-6 (</u>	(Contin	nued)				
	•	1. 	ŤĂ	ABLE NOT	'ATIOI	NS			*.	
(l) Abov	e backg	round	· · ·							
⁽²⁾ Nomi	nal rang	ge for Ch 7	and Ch 9.	The Alarm	in set (	on Ch 7.			· · · · · ·	
			and Ch 9.			\$		. :		
		_	s are not ap				ntrol	-	2.00 A	
Oulor	51 11 10		o uro not ap	Phonoio to		2 0.01 001	- <b>ve v</b> e e			
			ACT	<u> [ION STA]</u>	remei	NTS				
ACTION 35	OPEF		uirement, e						finimum Ch OPERABLE	
	a)	Initiate th paramete	ne preplanne r(s), and	ed alternate	metho	od of mon	itoring th	ie app	ropriate	
· ·	a) b)	paramete Return th Annual R	er(s), and the channel t	o OPERAB Effluent Re	BLE sta	tus within	n 30 days	, or, e	ropriate xplain in the pility was no	
		paramete Return th Annual R	er(s), and ne channel t Radioactive	o OPERAB Effluent Re	BLE sta	tus within	n 30 days	, or, e	explain in the	
· · ·		paramete Return th Annual R	er(s), and ne channel t Radioactive	o OPERAB Effluent Re	BLE sta	tus within	n 30 days	, or, e	explain in the	
		paramete Return th Annual R	er(s), and ne channel t Radioactive	o OPERAB Effluent Re	BLE sta	tus within	n 30 days	, or, e	explain in the	
		paramete Return th Annual R	er(s), and ne channel t Radioactive	o OPERAB Effluent Re	BLE sta	tus within	n 30 days	, or, e	explain in the	
		paramete Return th Annual R	er(s), and ne channel t Radioactive	o OPERAB Effluent Re	BLE sta	tus within	n 30 days	, or, e	explain in the	
		paramete Return th Annual R	er(s), and ne channel t Radioactive	o OPERAB Effluent Re	BLE sta	tus within	n 30 days	, or, e	explain in the	
		paramete Return th Annual R	er(s), and ne channel t Radioactive	o OPERAB Effluent Re	BLE sta	tus within	n 30 days	, or, e	explain in the	
		paramete Return th Annual R	er(s), and ne channel t Radioactive	o OPERAB Effluent Re	BLE sta	tus within	n 30 days	, or, e	explain in the	
		paramete Return th Annual R	er(s), and ne channel t Radioactive	o OPERAB Effluent Re	BLE sta	tus within	n 30 days	, or, e	explain in the	

Beaver Valley Pov		Procedure Number: 1/2-ODC-3.03			
Fitle:			Unit:	Level Of Use: General Skill Reference	
DDCM: Controls for RETS and REMP H	<u>1/2</u> Revision: 4	Page Number: 22 of 79			
<u>BV-1 RADIATION MONITORING</u> Pri = Primary Instruments <u>INSTRUMENT</u>	TABLE 4.3- INSTRUME	of 8 ONITORING IN <u>3 (Continued)</u>	ISTRUMENT /EILLANCE F	TATION REQUIREMENTS oring ^(a) MODES IN WHICH	
I. Noble Gas Effluent Monitors - SPINGS		·			
a. Reactor Building/SLCRS (CV-1; Also c <u>Mid Range Noble Gas</u> Pri: (RM-1VS-110 Ch 7) 1st PMM: (RM-1VS-112 SA-10) 2nd PMM: (RM-1VS-107B, or VS-110 C 3rd PMM: Grab Sampling every 12 hours	S h 5)	d Release) R	М	1, 2, 3, & 4	
High Range Noble Gas Pri: (RM-1VS-110 Ch 9) 1st PMM: (RM-1VS-112 SA-9) 2nd PMM: (RM-1VS-107B, or VS-110 Cl 3rd PMM: Grab Sampling every 12 hours	S h 5)	R	М	1, 2, 3, & 4	
<ul> <li>b. Auxiliary Building Ventilation System ( <u>Mid Range Noble Gas</u> Pri: (RM-1VS-109 Ch 7) 1st PMM: (RM-1VS-111 SA-10) 2nd PMM: (RM-1VS-101B, or VS-109 Cl</li> </ul>	VV-1; Also c S h 5)	alled Ventilation V R	ent) M	1, 2, 3, & 4	
<ul> <li>3rd PMM: Grab Sampling every 12 hours</li> <li><u>High Range Noble Gas</u></li> <li>Pri: (RM-1VS-109 Ch 9)</li> <li>1st PMM: (RM-1VS-111 SA-9)</li> <li>2nd PMM: (RM-1VS-101B, or VS-109 Cl</li> <li>3rd PMM: Grab Sampling every 12 hours</li> </ul>	S h 5)	R	M	1, 2, 3, & 4	
c. Gaseous Waste Process Vent System (P <u>Mid Range Noble Gas</u> Pri: (RM-1GW-109 Ch 7) 1st PMM: (RM-1GW-110 SA-10) 2nd PMM: (RM-1GW-108B, or GW-109 3rd PMM: Grab Sampling every 12 hours	S Ch 5)	R	М	1, 2, 3, & 4	
High Range Noble Gas Pri: RM-1GW-109 Ch 9) 1st PMM: (RM-1GW-110 SA-9) 2nd PMM: (RM-1GW-108B, or GW-109 3rd PMM: Grab Sampling every 12 hours		<b>R</b>	М	1, 2, 3, & 4	

Instruments or actions shown as PMM are the preplanned methods to be used when the primary instrument is inoperable. SINCE the PMM instruments shown are not considered comparable alternate monitoring channels, THEN the ODCM Surveillance Requirements do not apply to the PMM. Therefore, the reporting requirement of Action 35b would still apply when inoperability of the primary instrument exceeds 30 days.

3

(a)

	Beaver Valley P	ower Stat	tion	Procedure N	umber: 1/2-OD	C-3 03
Title:			<u> </u>	Unit:	Level O	f Use:
ഹറ	No. Controls for DETS and DEM			1/2 Revision:	Gener Page Nu	al Skill Refere
	M: Controls for RETS and REM			4		23 of 79
		ATTACH				
	ODCM CONTROLS: R	Page '		ISTRUMEN	ΤΔΤΙΩ	N
	ODEM CONTROLS. R			<b>OTROMEN</b>	initio	. 1
		<u>TABLE 4.3-</u>	-3 (Continued)			
<u>B</u>	V-1 RADIATION MONITORIN	<u>G INSTRUMI</u>	ENTATION SUR	VEILLANC	<u>E REQI</u>	JIREMENT
	Pri = Primary Instrume	ents, PMM	= Preplanned Me	thod of Mor	itoring ^{(a}	1)
				CHANNE		DES IN WHI
	INSTRUMENT	CHANNEL CHECK	CHANNEL CALIBRATION	FUNCTION TEST	AL SL	JRVEILLANC <u>REQUIRED</u>
7 No	ble Gas Effluent Steam Monitors	CHECK	CALIDIATION	11.51		REQUIRED
2. INU a.	Atmospheric Steam Dump Valve an	d Code Safety R	Relief Valve Dischar	ge	an a	e je stali se
	Pri: (RM-1MS-100A)	S	R	M		1, 2, 3, & 4
	PMM: (Form 1/2-HPP-4.02.009.F01)	0	D		•	10004
	Pri: (RM-1MS-100B) PMM: (Form 1/2-HPP-4.02.009.F01)	S	R	М	;	1, 2, 3, & 4
	Pri: (RM-1MS-100C)	S	R	М		1, 2, 3, & 4
L	PMM: (Form 1/2-HPP-4.02.009.F01)	10-1 · · · ·				. 4 <b>.</b> 1
n	Auxiliary Feedwater Pump Turbine	Exhaust -				
υ.	Pri: (RM-1MS-101)		R	M	•	123&4
υ.	Pri: (RM-1MS-101) PMM: (Form 1/2-HPP-4.02.009.F01)	S	R	M		1, 2, 3, & 4
5.	· · · ·		R	M		1, 2, 3, & 4
(a)	· · · ·	S	÷		mary instr	
	PMM: (Form 1/2-HPP-4.02.009.F01) Instruments or actions shown as PMM inoperable. <u>SINCE</u> the PMM instrume	S are the preplannents shown are no	ed methods to be use ot considered compar	d when the pri-	nonitorin	ument is g channels, <u>TI</u>
	PMM: (Form 1/2-HPP-4.02.009.F01) Instruments or actions shown as PMM	S are the preplannents shown are not do not apply to	ed methods to be use ot considered compar the PMM. Therefore	d when the print able alternate is the reporting	nonitorin	ument is g channels, <u>TI</u>
	PMM: (Form 1/2-HPP-4.02.009.F01) Instruments or actions shown as PMM inoperable. <u>SINCE</u> the PMM instrume the ODCM Surveillance Requirements	S are the preplannents shown are not do not apply to	ed methods to be use ot considered compar the PMM. Therefore	d when the print able alternate is the reporting	nonitorin	ument is g channels, <u>TH</u>
	PMM: (Form 1/2-HPP-4.02.009.F01) Instruments or actions shown as PMM inoperable. <u>SINCE</u> the PMM instrume the ODCM Surveillance Requirements	S are the preplannents shown are not do not apply to	ed methods to be use ot considered compar the PMM. Therefore	d when the print able alternate is the reporting	nonitorin	ument is g channels, <u>TI</u>
	PMM: (Form 1/2-HPP-4.02.009.F01) Instruments or actions shown as PMM inoperable. <u>SINCE</u> the PMM instrume the ODCM Surveillance Requirements	S are the preplannents shown are not do not apply to	ed methods to be use ot considered compar the PMM. Therefore	d when the print able alternate is the reporting	nonitorin	ument is g channels, <u>TH</u>
	PMM: (Form 1/2-HPP-4.02.009.F01) Instruments or actions shown as PMM inoperable. <u>SINCE</u> the PMM instrume the ODCM Surveillance Requirements	S are the preplannents shown are not do not apply to	ed methods to be use ot considered compar the PMM. Therefore	d when the print able alternate is the reporting	nonitorin	ument is g channels, <u>TH</u>
	PMM: (Form 1/2-HPP-4.02.009.F01) Instruments or actions shown as PMM inoperable. <u>SINCE</u> the PMM instrume the ODCM Surveillance Requirements	S are the preplannents shown are not do not apply to	ed methods to be use ot considered compar the PMM. Therefore	d when the print able alternate is the reporting	nonitorin	ument is g channels, <u>TI</u>
	PMM: (Form 1/2-HPP-4.02.009.F01) Instruments or actions shown as PMM inoperable. <u>SINCE</u> the PMM instrume the ODCM Surveillance Requirements	S are the preplannents shown are not do not apply to	ed methods to be use ot considered compar the PMM. Therefore	d when the print able alternate is the reporting	nonitorin	ument is g channels, <u>TH</u>
	PMM: (Form 1/2-HPP-4.02.009.F01) Instruments or actions shown as PMM inoperable. <u>SINCE</u> the PMM instrume the ODCM Surveillance Requirements	S are the preplannents shown are not do not apply to	ed methods to be use ot considered compar the PMM. Therefore	d when the print able alternate is the reporting	nonitorin	g channels, <u>TF</u>
	PMM: (Form 1/2-HPP-4.02.009.F01) Instruments or actions shown as PMM inoperable. <u>SINCE</u> the PMM instrume the ODCM Surveillance Requirements	S are the preplannents shown are not do not apply to	ed methods to be use ot considered compar the PMM. Therefore	d when the print able alternate is the reporting	nonitorin	ument is g channels, <u>TH</u>
	PMM: (Form 1/2-HPP-4.02.009.F01) Instruments or actions shown as PMM inoperable. <u>SINCE</u> the PMM instrume the ODCM Surveillance Requirements	S are the preplannents shown are not do not apply to	ed methods to be use ot considered compar the PMM. Therefore	d when the print able alternate is the reporting	nonitorin	ument is g channels, <u>TI</u>
	PMM: (Form 1/2-HPP-4.02.009.F01) Instruments or actions shown as PMM inoperable. <u>SINCE</u> the PMM instrume the ODCM Surveillance Requirements	S are the preplannents shown are not do not apply to	ed methods to be use ot considered compar the PMM. Therefore	d when the print able alternate is the reporting	nonitorin	ument is g channels, <u>TH</u>
	PMM: (Form 1/2-HPP-4.02.009.F01) Instruments or actions shown as PMM inoperable. <u>SINCE</u> the PMM instrume the ODCM Surveillance Requirements	S are the preplannents shown are not do not apply to	ed methods to be use ot considered compar the PMM. Therefore	d when the print able alternate is the reporting	nonitorin	ument is g channels, <u>TH</u>
	PMM: (Form 1/2-HPP-4.02.009.F01) Instruments or actions shown as PMM inoperable. <u>SINCE</u> the PMM instrume the ODCM Surveillance Requirements	S are the preplannents shown are not do not apply to	ed methods to be use ot considered compar the PMM. Therefore	d when the print able alternate is the reporting	nonitorin	ument is g channels, <u>TF</u>
	PMM: (Form 1/2-HPP-4.02.009.F01) Instruments or actions shown as PMM inoperable. <u>SINCE</u> the PMM instrume the ODCM Surveillance Requirements	S are the preplannents shown are not do not apply to	ed methods to be use ot considered compar the PMM. Therefore	d when the print able alternate is the reporting	nonitorin	ument is g channels, <u>TF</u>

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	Beaver Va	lley Power	Station		Procedure Nu	mber: 1/2-ODC-3.03
Title:		✓			Unit:	Level Of Use:
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ODCM:	Controls for RETS	and REMP Prog	rams		Revision:	Page Number:
	· · · · · · · · · · · · · · · · · · ·	Γ.۸	TACHMEN		4	24 of 79
				I D		
	ODCM CONTR	ROLS: RADIAT	Page 8 of 8		NOTDINAENI	TATION
	UDCWI CUNTR	ULS. KADIAI			NSTRUMEN	TATION
		. <u>.T</u>	ABLE 4.3-3	(Continue	<u>d)</u>	
<u>BV-2</u>	RADIATION MON	IITORING INST	RUMENTA	TION SUI	RVEILLANC	E REQUIREMENTS
	Pri = Primary	Instruments,	PMM = Pre	planned M	ethod of Mon	itoring ^(a)
ал ^а та 44	an a		· · · ·			-
, · · · ·		CHAN		A NIVIET	CHANNEL FUNCTION	
	INSTRUMENT	CHAN		IANNEL BRATION	FUNCTION/ TEST	REQUIRED
1 Maili		<u>~</u>			1101	<u></u>
	Gas Effluent Monitors					·
	CRS Unfiltered Pathwa	• • •	led Elevated R			
	id Range Noble Gas	. <b>S</b>		R	М	1, 2, 3, & 4
	: (2HVS-RQ109C) PMM: (2HVS-RQ109I	ור				
	d PMM: (2HVS-RQ1091					
	I PMM: Grab Sampling				. •	
Hi	gh Range Noble Gas	S	•	R	М	1, 2, 3, & 4
	: (2HVS-RQ109D)					
	PMM: (2HVS-RQ1090					·
	d PMM: (2HVS-RQ1091 PMM: Grab Sampling		-			
510	The one output	every 12 nours				
- 	· •					
ino the		M instruments show quirements do not a	vn are not consi pply to the PM	dered compa M. Therefor	rable alternate n e, the reporting	nary instrument is nonitoring channels, <u>THE</u> requirement of Action 35
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	Beaver Valley Power Station			1	1/2-ODC-3.03			
Fitle:						Unit: 1/2	Level Of Use: General Skill Refe	rence
ODCN	1: Contr	ols for RETS a	nd REMP Progra	ams		Revision:	Page Number:	
			AT	ГАСНМЕ	ENT E	4	25 of 79	
				Page 1 of				
	OD	CM CONTROI	LS: RETS INST	RUMEN	FATION FOR	R LIQUID EI	FFLUENTS	
CON	TROLS:	RADIOACTIV	VE LIQUID EFF	LUENT	MONITORIN	G INSTRUM	IENTATION	
3.3.3.	9		with BV-1 and F		-			
			•	•			own in ODCM Co tpoints set to ensu	
						-	The alarm/trip setpo	
			n monitoring cha	annels sha	ll be determin	ned in accord	ance with 1/2-OD	C-
		2.01.			. • •	· · · ·		
<u>Appli</u>	cability:	During release	es through the flo	ow path.		:		
Actio	n:							
					•• •			
a.			uid effluent mon uired by the abov	• -			rm/trip setpoint les	S
		•	•	-			ne alarm/trip setpo	int.
1		-		•	2			
b.							channels inoperable ervatively reduce t	
	alarm	setpoint. Exert	a best effort to r	eturn the	channel to op	erable status	within 30 days, an	
		-	in the next Annu			nt Release Re	port why the	
	moper	adility was not	corrected in a tin	nery man	ler.	·		
c.	The pr	ovisions of OD	CM CONTROL	3.0.3 are	not applicabl	e.		
SUR	VEILLA	NCE REQUIRI	EMENTS					
					······································		· •	
4.3.3.	Q	Fach radioacti	ive liquid effluen	t monitor	ing instrumer	ntation chann	el shall he	
1.5.5.	<b>J</b>						K, SOURCE CHE	CK
	<u>``</u>						EST operations at t	he
•		frequencies sh	own in ODCM (			1.3-12.	1943 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 -	
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Beaver Valley Power Station	Procedure Number: 1/2-ODC-3.03			
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ODCM: Controls for RETS and REMP Programs	<u>1/2</u> Revision:	Page Number:		
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Page 2 of 10				
ODCM CONTROLS: RETS INSTRUMENTATION FOR	LIQUID EF	FLUENTS		
<u>TABLE 3.3-12</u>				
<b>BV-1 RADIOACTIVE LIQUID EFFLUENT MONITORIN</b>	IG INSTRU	MENTATION		
Pri = Primary Instruments, Alt = Alternate	Instruments			
	in the second	4		
	IINIMUM HANNELS			
	PERABLE	ACTION		
1 Cross Activity Monitors Providing Automatic Termination O	f Delegge			
1. Gross Activity Monitors Providing Automatic Termination O a. Liquid Waste Effluents Monitor	(1)	23		
Pri: (RM-1LW-104)				
<ul> <li>b. Liquid Waste Contaminated Drain Monitor</li> <li>Pri: (RM-1LW-116)</li> </ul>	(1)	23		
<ul> <li>c. Auxiliary Feed Pump Bay Drain Monitor</li> <li>Pri: (RM-1DA-100)</li> </ul>	(1)	. 24		
2. Gross Activity Monitors Not Providing Termination Of Relea	CA .			
<ul> <li>a. Component Cooling-Recirculation Spray Heat Exchangers River Water Monitor Pri: (RM-1RW-100)</li> </ul>	(1)	24		
3. Flow Rate Measurement Devices	· .			
a. Liquid Radwaste Effluent Line	(1)	25		
Pri: (FR-1LW-104) for (RM-1LW-104)				
<ul> <li>b. Liquid Waste Contaminated Drain Line</li> <li>Pri: (FR-1LW-103) for (RM-1LW-116)</li> </ul>	(1)	- 25		
c. Cooling Tower Blowdown Line	(1)	25		
Pri: (FT-1CW-101-1) or Alt: (FT-1CW-101) and (2CWS-FT101)	•			
4. Tank Level Indicating Devices (for tanks outside plant building	ng)			
a. Primary Water Storage Tank Pri: (LI-1PG-115A) for (1BR-TK-6A)	(1)	26		
b. Primary Water Storage Tank Pri: (LI-1PG-115B) for (1BR-TK-6B)	(1)	26		
c. Steam Generator Drain Tank Pri: (LI-1LW-110) for (1LW-TK-7A)	(1)	26		
d. Steam Generator Drain Tank Pri: (LI-1LW-111) for (1LW-TK-7B)	(1)	26		
<ul> <li>The test of the model of the second structure of the second second structure of the second structure of the second second structure of the second second second structure of the second s</li></ul>		and the second		

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Beaver Valley Power Station	Procedure Nu	mber: 1/2-ODC-3.03
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ODCM: Controls for RETS and REMP Programs	Revision:	Page Number:
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ODCM CONTROLS: RETS INSTRUMENTATION FC	R LIQUID EF	FLUENTS
TABLE 3.3-12 (continued)		
<b>BV-2 RADIOACTIVE LIQUID EFFLUENT MONITORI</b>	NG INSTRUM	IENTATION
Pri = Primary Instruments, Alt = Alternate		
and a second second Second second	MINIMUM	
- -	CHANNELS	
INSTRUMENT	<u>OPERABLE</u>	<u>ACTION</u>
1. Gross Radioactivity Monitor Providing Alarm And Automa	tic Terminati	on Of Release
a. Liquid Waste Process Effluent Monitor Pri: (2SGC-RQ100)	(1)	23
2. Gross Radioactivity Monitors Providing Alarm But Not Pro	oviding Termi	nation Of Release
a. None Required	5 °	
3. Flow Rate Measurement Devices		
a. Liquid Radwaste Effluent Pri: (2SGC-FS100)	(1)	25
<ul> <li>b. Cooling Tower Blowdown Line</li> <li>Pri: (FT-1CW-101-1) or</li> <li>Alt: (FT-1CW-101) and (2CWS-FT101)</li> </ul>	(1)	25
4. Tank Level Indicating Devices (for tanks outside plant build	dings)	-
a. None Required		
• 1 • 1 • 1 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 • 2 <td>- ¥(*</td> <td></td>	- ¥(*	

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Beaver	Valley	Power	Station
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Procedure Number:

ODCM: Controls for RETS and REMP Programs

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ODCM CONTROLS: RETS INSTRUMENTATION FOR LIQUID EFFLUENTS

#### TABLE 3.3-12 (continued)

#### ACTION STATEMENTS

Action 23

Title:

3 With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases may be initiated (or resumed) provided that prior to release:

- 1. At least two independent samples are analyzed in accordance with ODCM SURVEILLANCE REQUIREMENT 4.11.1.1.1, and at least two technically qualified members of the Facility Staff independently verify the release rate calculations⁽¹⁾ and discharge valving, or
- 2. Initiate monitoring with the comparable alternate monitoring channel. ODCM Surveillance requirements applicable to the inoperable channel shall apply to the comparable alternate monitoring channel when used to satisfy this ODCM CONTROL requirement.

Otherwise, suspend release of radioactive effluents via this pathway.

Action 24 With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue provided:

1. That at least once per 12 hours grab samples are analyzed for gross radioactivity (beta or gamma) at a Lower Limit of Detection (LLD) of at least 1E-7 uCi/ml, or

2. Initiate monitoring with the comparable alternate monitoring channel. ODCM Surveillance requirements applicable to the inoperable channel shall apply to the comparable alternate monitoring channel when used to satisfy this ODCM CONTROL requirement.

(1) Since the computer software used for discharge permit generation automatically performs the release rate calculations, then the independent signatures on the discharge permit for "preparer" and "reviewer" satisfy the requirement for "...two technically qualified members of the Facility Staff independently verify the release rate calculations..."

Procedure Nu	mber:
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1/2-ODC-3.03 Title: Unit: Level Of Use: **General Skill Reference** 1/2Page Number: Revision: **ODCM: Controls for RETS and REMP Programs** 29 of 79 Δ ATTACHMENT E Page 5 of 10 ODCM CONTROLS: RETS INSTRUMENTATION FOR LIQUID EFFLUENTS Table 3.3-12 (continued) **ACTION STATEMENTS** With the number of channels OPERABLE less than required by the Minimum Channels Action 25 OPERABLE requirement, effluent releases via this pathway may continue provided: 1. The flow rate is estimated at least once per 4 hours during actual releases. (Pump curves may be used to estimate flow), or 2. Initiate monitoring with the comparable alternate monitoring channel. ODCM Surveillance requirements applicable to the inoperable channel shall apply to the comparable alternate monitoring channel when used to satisfy this ODCM CONTROL requirement. Action 26 With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, liquid additions to this tank may continue provided: The tank liquid level is estimated during all liquid additions to the tank, or 1. 2. Initiate monitoring with the comparable alternate monitoring channel. ODCM Surveillance requirements applicable to the inoperable channel shall apply to the comparable alternate monitoring channel when used to satisfy this ODCM CONTROL requirement.

Reaver Valley Pour	Beaver Valley Power Station			
······································				-ODC-3.03
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	Page 6 of 10			
ODCM CONTROLS: RETS IN	NSTRUMENTA	ATION FOR L	IQUID EFFI	LUENTS
	TABLE 4.3	-12		
<b>BV-1 RADIOACTIV</b>				·
INSTRUMENTATIO	<u>ON SURVEILL</u>	ANCE REQU	<u>REMENTS</u>	
Pri = Primary Inst	rumente Alt	= Alternate In	struments	. · · ·
1 II – I IIIIary IIIst	runchs, Ait	- Alternate In	Summents	
			•	CHANNEL
DICTDI BADIT	CHANNEL	SOURCE	CHANNE	
<b>INSTRUMENT</b>	CHECK	<u>CHECK</u>	CALIBRAT	
1. Gross Beta or Gamma Radioactivity Monitor	rs Providing Alar			
a. Liquid Radwaste Effluent Line Pri: (RM-1LW-104)	D	P ⁽⁵⁾	R ⁽³⁾	Q ⁽¹⁾
b. Liquid Waste Contaminated	D	P ⁽⁵⁾	R ⁽³⁾	Q ⁽¹⁾
Drain Line Pri: (RM-1LW-116)				
	•	~	<b>n</b> (3)	
c. Auxiliary Feed Pump Bay Drain Monitor	D	D	R ⁽³⁾	Q ⁽¹⁾
Pri: (RM-1DA-100)				
2. Gross Beta Or Gamma Radioactivity Monito	rs Providing Alaı	rm But Not Prov	iding Automat	ic Termination Of
Release			8	
a. Component Cooling - Recirculation	D	M ⁽⁵⁾	R ⁽³⁾	Q ⁽²⁾
Spray Heat Exchangers River Water Monitor	· · · · ·			
Pri: (RM-1RW-100)				
3. Flow Rate Monitors				
	D ⁽⁴⁾	NT A	р	0
a. Liquid Radwaste Effluent Lines Pri: (FR-1LW-104) for (RM-1LW-104)	D' '	NA	R	Q
b. Liquid Waste Contaminated Drain Line	D ⁽⁴⁾	NA	R	Q
Pri: (FR-1LW-103) for (RM-1LW-116)	$\boldsymbol{\nu}^{\circ}$	INA	ĸ	۲ ۲
c. Cooling Tower Blowdown Line	D ⁽⁴⁾	NA	R	Q
Pri: (FT-1CW-101-1) or		INA	K	×
Alt: (FT-1CW-101) and (2CWS-FT101)				

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	ODCM CONTROLS: RETS	INSTRUMENTA	TION FOR L	IQUID EFFLU	ENTS
	<u>1</u>	ABLE 4.3-12 (cor	ntinued)		
	BV-1 RADIOACT				
		struments, Alt =	· · · ·		
	INSTRUMENT	CHANNEL <u>CHECK</u>	SOURCE <u>CHECK</u>	CHANNEL <u>CALIBRATIO</u>	CHANNEL FUNCTIONAL <u>N TEST</u>
4.	Tank Level Indicating Devices (for tank	s outside plant buildi	ngs)		
a	Primary Water Storage Tank Pri: (LI-1PG-115A) for (1BR-TK-6A)	D*	NA	R	Q
b	. Primary Water Storage Tank Pri: (LI -1PG-115B) for (1BR-TK-6B)	D*	NA	R	<b>Q</b>
C	. Steam Generator Drain Tank Pri: (LI-1LW-110) for (1LW-TK-7A)	D*	NA	R	Q
d	. Steam Generator Drain Tank Pri: (LI-1LW-111) for (1LW-TK-7B)	<b>D*</b>	NA	R	Q
					• .
*D	uring liquid additions to the tank.				
	,				
				-	
	<b>^</b>		•		
		•	<i>.</i>		
			. [*] •		:

Beaver Valley Pov	Procedure Number: 1/2-ODC-3.03			
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ODCM CONTROLS: RETS	INSTRUMENTA	TION FOR I	IQUID EFF.	LUENTS
. 1	TABLE 4.3-12 (cc	ntinued)		
· _	IADLE 4.3-12 (C	minucuj		
<b>BV-2 RADIOAC</b>	<b>FIVE LIQUID EF</b>	FLUENT MC	NITORING	, T
INSTRUMENTAT				
<u>a to raconistant</u>				5
Pri = Primary In	struments, Alt	= Alternate I	nstruments	
•	,			
	i.			CHANNEL
	CHANNEL	SOURCE	CHANN	
INSTRUMENT	<u>CHECK</u>	<u>CHECK</u>	<u>CALIBRA</u>	<u>TION</u> <u>TEST</u>
1. Gross Radioactivity Monitor Providing Ala	arm And Automatic			· ·
a. Liquid Waste Process Effluent	D	P ⁽⁵⁾	R ⁽⁸⁾⁽³⁾	Q ⁽⁷⁾
Pri: (2SGC-RQ100)				
2. Flow Rate Measurement Devices				•
a. Liquid Radwaste Effluent	D ⁽⁴⁾	NA	R	Q
Pri: (2SGC-FS100)				×
b. Cooling Tower Blowdown Line	D ⁽⁴⁾	NA	R	Q
Pri: (FT-1CW-101-1) or	D	147 1	IX.	
Alt: (FT-1CW-101) and (2CWS-FT101)	:			
3. Tank Level Indicating Devices (for tanks o	utside plant building	zs)		
a. None Required		5-7		
				<b>、</b>
				•
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# ODCM CONTROLS: RETS INSTRUMENTATION FOR LIQUID EFFLUENTS

#### TABLE 4.3-12 (continued)

#### **TABLE NOTATION**

The CHANNEL FUNCTIONAL TEST shall also demonstrate that automatic isolation of this pathway and Control Room Alarm Annunciation occurs if any of the following conditions exist:

- 1. Instrument indicates measured levels above the alarm/trip setpoint.
- 2. Downscale failure.
- 3. Instrument controls not set in operate mode.

⁽²⁾ The CHANNEL FUNCTIONAL TEST shall also demonstrate that Control Room Alarm Annunciation occurs if any of the following conditions exist:

1. Instrument indicates measured levels above the alarm/trip setpoint.

2. Downscale failure.

3. Instrument controls are not set in operate mode.

The initial CHANNEL CALIBRATION for radioactivity measurement instrumentation shall be performed using one or more of the reference standards certified by the National Bureau of (Standards/NIST) or using standards that have been obtained from suppliers that participate in measurement assurance activities with NBS/NIST. These standards should permit calibrating the system over its intended range of energy and rate capabilities. For subsequent CHANNEL CALIBRATION, sources that have been related to the initial calibration should be used, at intervals of at least once per 18 months. This can normally be accomplished during refueling outages. (Existing plants may substitute previously established calibration procedures for this requirement).

CHANNEL CHECK shall consist of verifying indication of flow during periods of release. CHANNEL CHECK shall be made at least once daily on any day on which continuous, periodic, or batch releases are made.

A SOURCE CHECK may be performed utilizing the installed means or flashing the detector with a portable source to obtain an upscale increase in the existing count rate to verify channel response.

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# ODCM CONTROLS: RETS INSTRUMENTATION FOR LIQUID EFFLUENTS

#### TABLE 4.3-12 (continued)

#### **TABLE NOTATION**

⁽⁶⁾ The CHANNEL FUNCTIONAL TEST shall also demonstrate that automatic isolation of this pathway and Control Room Alarm Annunciation occurs when the instrument indicates measured levels above the Alarm/Trip Setpoint.

The CHANNEL FUNCTIONAL TEST shall also demonstrate that Control Alarm Annunciation occurs if any of the following conditions exists:

1. Downscale failure.

2. Instrument controls are not set in operate mode.

⁽⁷⁾ The CHANNEL FUNCTIONAL TEST shall also demonstrate that automatic isolation of this pathway and Control Room Alarm Annunciation occurs if the instrument indicates measured levels above the alarm/trip setpoint.

(8) The CHANNEL CALIBRATION shall also demonstrate that Control Room Alarm Annunciation occurs if either of the following conditions exist:

1. Downscale failure.

2. Instrument controls are not set in operate mode.

Title:

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	ODCM CONTROLS: RETS INSTRUMENT FOR	GASEOUS REI	LEASES
CONTROI	LS: RADIOACTIVE GASEOUS EFFLUENT MONIT	ORING INSTR	UMENTATION
3.3.3.10	In accordance with BV-1 and BV-2 Technical Speci gaseous effluent monitoring instrumentation channe Table 3.3-13 shall be operable with their alarm/trip s ODCM CONTROL 3.11.2.1 are not exceeded. The monitoring channels shall be determined in accordan	ls shown in OD setpoints set to e alarm/trip setpo	CM Control 3.3.3.10 ensure that the limits pints of the radiation
<u>Applicabili</u>	ty: During releases through the flow path.	s A di	• •
Action:			
	2.1 are met, immediately suspend the release of radioad	ctive gaseous eff	fluents monitored by
b. With take t alarm unsuc	fected channel or correct the alarm/trip setpoint. one or more radioactive gaseous effluent monitoring in he ACTION shown in ODCM Control 3.3.3.10, Table setpoint. Exert a best effort to return the channel to o ccessful, explain in the next Annual Radioactive Efflue rability was not corrected in a timely manner.	3.3-13 or conse perable status w	ervatively reduce the vithin 30 days, and if
b. With take t alarm unsuc inope	one or more radioactive gaseous effluent monitoring in the ACTION shown in ODCM Control 3.3.3.10, Table setpoint. Exert a best effort to return the channel to o ccessful, explain in the next Annual Radioactive Efflue	3.3-13 or conse perable status w ent Release Repo	ervatively reduce the vithin 30 days, and if
<ul> <li>b. With take t alarm unsuc inope</li> <li>c. The</li> </ul>	one or more radioactive gaseous effluent monitoring in he ACTION shown in ODCM Control 3.3.3.10, Table setpoint. Exert a best effort to return the channel to o ccessful, explain in the next Annual Radioactive Efflue rability was not corrected in a timely manner.	3.3-13 or conse perable status w ent Release Repo	ervatively reduce the vithin 30 days, and if
<ul> <li>b. With take t alarm unsuc inope</li> <li>c. The</li> </ul>	one or more radioactive gaseous effluent monitoring in he ACTION shown in ODCM Control 3.3.3.10, Table setpoint. Exert a best effort to return the channel to o ccessful, explain in the next Annual Radioactive Efflue rability was not corrected in a timely manner.	3.3-13 or conse perable status w ent Release Repo	rvatively reduce the vithin 30 days, and if
<ul> <li>b. With take t alarm unsuc inope</li> <li>c. The</li> </ul>	one or more radioactive gaseous effluent monitoring in he ACTION shown in ODCM Control 3.3.3.10, Table setpoint. Exert a best effort to return the channel to o ccessful, explain in the next Annual Radioactive Efflue rability was not corrected in a timely manner.	3.3-13 or conse perable status w ent Release Repo- able. mentation chann NEL CHECK, CTIONAL TES	ervatively reduce the vithin 30 days, and if ort why the el shall be SOURCE CHECK,
<ul> <li>b. With take t alarm unsuc inope</li> <li>c. The SURVEILI</li> </ul>	one or more radioactive gaseous effluent monitoring in he ACTION shown in ODCM Control 3.3.3.10, Table setpoint. Exert a best effort to return the channel to o cessful, explain in the next Annual Radioactive Efflue rability was not corrected in a timely manner. provisions of ODCM CONTROL 3.0.3 are not applic LANCE REQUIREMENTS Each radioactive gaseous effluent monitoring instru- demonstrated operable by performance of the CHAN CHANNEL CALIBRATION, and CHANNEL FUN	3.3-13 or conse perable status w ent Release Repo- able. mentation chann NEL CHECK, CTIONAL TES	ervatively reduce the vithin 30 days, and if ort why the 
<ul> <li>b. With take t alarm unsuc inope</li> <li>c. The SURVEILI</li> </ul>	one or more radioactive gaseous effluent monitoring in he ACTION shown in ODCM Control 3.3.3.10, Table setpoint. Exert a best effort to return the channel to o cessful, explain in the next Annual Radioactive Efflue rability was not corrected in a timely manner. provisions of ODCM CONTROL 3.0.3 are not applic LANCE REQUIREMENTS Each radioactive gaseous effluent monitoring instru- demonstrated operable by performance of the CHAN CHANNEL CALIBRATION, and CHANNEL FUN	3.3-13 or conse perable status w ent Release Repo- able. mentation chann NEL CHECK, CTIONAL TES	ervatively reduce the vithin 30 days, and if ort why the 

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	ODCM CONTROLS: RETS INSTRUMEN	VT FOR	GAS	EOUS	S REL	EASE	ËS	
	TABLE 3.3-	· <u>13</u>			<i>.</i> .			
	<b>BV-1 RADIOACTIVE GASEOUS EFFLUENT 1</b>	MONITO	RING	INSTR	UMEN	ITATIO	<u>DN</u>	
	Pri = Primary Instruments, Alt =	Alternat	e Instru	ments				
		MINIMUN						
		HANNE				T. <b>F</b> TS.7		ЪŤ
· ,	INSTRUMENT C	PERABL	<u>E</u>	<u>APPI</u>	ICABI		<u>ACTIO</u>	N
	seous Waste/Process Vent System (PV-1,2) Noble Gas Activity Monitor Pri: (RM-1GW-108B) or	(1)		• : •	*		27,29,30A,3	0B
	monitoring channel for batch releases of the BV-1 GWDT's or does not perform the same automatic isolation function as the for batch releases of the BV-1 GWDT's or the BV-2 GWST's	primary via this p	channe	I, <u>THE</u>			shall be follo	
b.	Particulate and Iodine Sampler	(1)			*		32	
	Pri: (Filter Paper & Charcoal Cartridge for RM-1GW-109) on 1st Alt: (Filter Paper & Charcoal Cartridge for RM-1GW-110 2nd Alt: (Continuous collection via RASP Pump) or 3rd Alt: (Grab samples every 12 hours)		•					
с.	System Effluent Flow Rate Measuring Device Pri: (FR-1GW-108) or Alt: (RM-1GW-109 Ch 10)	(1)	. /		*		28A	
d.	Particulate and Iodine Sample Collection (see 1.b) Pri: (RM-1GW-109 Ch 15) or	(1)			*	-	28B	
2	Alt: (Rotometer: FM-1GW-101, and Vacuum Gauge: PI-1GV	-	Vart					
2. <i>a</i> .	Auxiliary BuildingVentilation System (VV-1; Also called Ve Noble Gas Activity Monitor Pri: (RM-1VS-101B) or Alt: (RM-1VS-109 Ch 5)	(1)	v chtj	į	*	-	29,30A	
	Particulate and Iodine Sampler	(1)	·	,	* .		32	
b.								
b.	Pri: (Filter Paper & Charcoal Cartridge for RM-1VS-109) or 1st Alt: (Filter Paper & Charcoal Cartridge for RM-1VS-111) 2nd Alt: (Continuous collection via RASP Pump) or 3rd Alt: (Grab samples every 12 hours)							
	1st Alt: (Filter Paper & Charcoal Cartridge for RM-1VS-111) 2nd Alt: (Continuous collection via RASP Pump) or				*		28A	

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		÷ .				
			13 (continued)			
	<b>BV-1 RADIOACTIVE GASE</b>	<u>)US EFFLUI</u>	ENT MONITOR	<u>ING INSTRU</u>	MENTATION	
	Pri = Primary I	nstruments,	Alt = Alternat	e Instruments		
	· · · · · ·		MINIMUM			
			<b>CHANNELS</b>			
3 Do	<u>INSTRUMENT</u> actor Building/SLCRS (CV-1; Also call	ind Flovetod P	OPERABLE	APPLICABI	LITY ACTION	
э. ке а.	Noble Gas Activity Monitor	icu Licvatcu N	(1)	*	29,30A	
	Pri: (RM-1VS-107B) or Alt: (RM-1VS-110 Ch 5)					
b.	Particulate and Iodine Sampler		(1)	*	32	
	Pri: (Filter Paper & Charcoal Cartridge 1st Alt: (Filter Paper & Charcoal Cartrid 2nd Alt: (Continuous collection via RAS	ige for RM-1VS	0) or	99 - L		
	3rd Alt: (Grab samples every 12 hours)		<i>(</i> 1)		•••	
C.	System Effluent Flow Rate Measuring Pri: (FR-1VS-112) or Alt: (RM-1VS-110 Ch 10)	y Device	<b>(1)</b>	*	28A	
d.	Sampler Flow Rate Measuring Device Particulate and Iodine Sample Collect Pri: (RM-1VS-110 Ch 15) or		(1)	*	28B	
	Alt: (Rotometer: FM-IVS-103, and Vac	uum Gauge: PI-	-1VS-660)			
					_	
*Dui	ring Releases via this pathway.				-	
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		13 (continued)		
	<b>BV-2 RADIOACTIVE GASEOUS EFFLU</b>	ENT MONITORI	<u>NG INSTRUM</u>	ENTATION
	Pri = Primary Instruments,	Alt = Alternate	e Instruments	
		MINIMUM		
		CHANNELS		
1 SL	<u>INSTRUMENT</u> CRS Unfiltered Pathway (VV-2; Also called Ventilat	OPERABLE ion Vent)	APPLICABI	<u>ACTION</u>
1. SL 8.	Noble Gas Activity Monitor	(1)	*	<b>29, 30</b> B
	Pri: (2HVS-RQ101B)	· · · · · ·		
b.	Particulate and Iodine Sampler Pri: (Filter Paper & Charcoal Cartridge for 2HVS-RQ1 1st Alt: (Continuous collection via RASP Pump) or 2nd Alt: (Grab samples every 12 hours)	(1) 01) or	*	32
c.	<b>Process Flow Rate Monitor</b> Pri: (Monitor Item 29 for 2HVS-VP101)	(1)	*	28A
d.	Sampler Flow Rate Monitor Used for Particulate and Iodine Sample Collection (see 1.b) Pri: (2HVS-FIT101)	(1)	*	28B
2. SL	CRS Filtered Pathway (CV-2; Also called Elevated R	-		
a.	Noble Gas Activity Monitor Pri: (2HVS-RQ109B)	(1)	*	29, 30B
b.	Particulate and Iodine Sampler Pri: (Filter Paper & Charcoal Cartridge for 2HVS-RQ1 1st Alt: (Continuous collection via RASP Pump) or 2nd Alt: (Grab samples every 12 hours)	(1) 09 High Flow Path)	* Or	. 32
c.	Process Flow Rate Monitor Pri: (Monitor Item 29 for 2HVS-FR22) or 1st Alt: (2HVS-FI22A and FI22C) or 2nd Alt: (2HVS-FI22B and FI22D)	(1)	•*	28A
d.	Sampler Flow Rate Monitor Used for Particulate and Iodine Sample Collection (see 2.b) Pri: (Monitor Items 28 and 72 for 2HVS-DAU109B)	(1)	*	- 28B
3. De	contamination Building Vent (DV-2)			
<b>a.</b>	Noble Gas Activity Monitor Pri: (2RMQ-RQ301B)	(1)	*	29
b. _.	Particulate and Iodine Sampler Pri: (Filter Paper & Charcoal Cartridge for 2RMQ-RQ: 1st Alt: (Continuous collection via RASP Pump) 2nd Alt: (Grab samples every 12 hours)	(1) 301) or	<b>*</b>	32
c.	Process Flow Rate Monitor	None	None	None
d.	Sampler Flow Rate Monitor Used for Particulate and Iodine Sample Collection (see 3.b) Pri: (2RMQ-FIT301)	(1)	*	28B
*D	ing Releases via this pathway.			

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ODCM	Page 5 o CONTROLS: RETS INSTRUM		SEOUS REI	LEASES	
	TABLE 3.3-13	<u>(continued)</u>			
BV-2 RADIO	DACTIVE GASEOUS EFFLUE	NT MONITOR	ING INSTR	UMENTATION	
	Pri = Primary Instruments,	Alt = Alternate	Instruments	<b>5</b>	
		MINIMUM CHANNELS			
<u>IN</u> 4. Condensate Polishing	<u>STRUMENT</u> Building Vent (CB-2)	OPERABLE	APPLICAB	ACTION	
a. Noble Gas Activi Pri: (2HVL-RQ11		(1)	*	29	
1st Alt: (Continuo	odine Sampler & Charcoal Cartridge for 2HVL-RQ112 us collection via RASP Pump) nples every 12 hours)	(1)	*	32	
c. Process Flow Rat	e Monitor	None	None	None	
	te Monitor Used for Particulate le Collection (see 4.b) 2)	(1)	*	28B	
5. Waste Gas Storage V	ault Vent (WV-2)	:			
a. Noble Gas Activi Pri: (2RMQ-RQ30		(1)	*	29	
1st Alt: (Continuo	odine Sampler & Charcoal Cartridge for 2RMQ-RQ303 us collection via RASP Pump) nples every 12 hours)	(1) 3)	*	32	
c. Process Flow Rat	• • •	None	None	None	
	te Monitor Used for Particulate le Collection (see 5.b) )3)	(1)	* 	- 28B	
	۰۰ بر میں	n na serie de la companya de la comp Na serie de la companya de la company	· · · ·		
		· · · · ·			
*During Releases via t	his pathway.				
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#### ODCM CONTROLS: RETS INSTRUMENT FOR GASEOUS RELEASES

#### TABLE 3.3-13 (continued)

#### **ACTION STATEMENTS**

Action 27

(1)

Title:

#### APPLICABLE FOR BATCH RELEASES OF BV-1 GASEOUS WASTE DECAY TANKS OR BV-2 GASEOUS WASTE STORAGE TANKS

With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, the contents of the Unit 1 Gaseous Waste Decay Tanks (GWDT's) or the Unit 2 Gaseous Waste Storage Tanks (GWST's) may be released to the environment provided that prior to initiating (or resuming) the release:

- 1. At least two independent samples of the tank's content are analyzed and at least two technically qualified members of the Facility Staff independently verify the release rate calculations and discharge valve lineup, or
- 2. Initiate continuous monitoring with the comparable alternate monitoring channel. ODCM Surveillance requirements applicable to the inoperable channel shall apply to the comparable alternate monitoring channel when used to satisfy this ODCM Control requirement.

Otherwise, suspend releases of radioactive effluents via this pathway.

Action 28A <u>APPLICABLE FOR BV-1 SYSTEM EFFLUENT FLOW RATE MEASURING</u> DEVICES OR BV-2 PROCESS FLOWRATE MONITORS

With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue provided:

- 1. The system/process flow rate is estimated at least once per 4 hours (or assumed to be at the ODCM design value⁽¹⁾), or
- 2. Initiate continuous monitoring with the comparable alternate monitoring channel. ODCM Surveillance requirements applicable to the inoperable channel shall apply to the comparable alternate monitoring channel when used to satisfy this ODCM Control requirement.
- In lieu of estimating the system/process flow rate at least once per 4 hours, the system/process flow rate can be assumed to be at the following ODCM design values:

1,450 cfm = BV-1 Gaseous Waste/Process Vent System (PV-1,2) 62,000 cfm = BV-1 Auxiliary Building Ventilation System (VV-1) 49,300 cfm = BV-1 Reactor Building/SLCRS (CV-1) 23,700 cfm = BV-2 SLCRS Unfiltered Pathway (VV-2) 59,000 cfm = BV-2 SLCRS Filtered Pathway (CV-2)

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(	ODCM CO	ONTROLS	: RETS INST	RUMENT F	FOR GAS	SEOUS RE	LEASE	ES	
			TABLE 3	.3-13 (conti	nued)				
				STATEME					
Action 28B			<u>R BV-1 SAMI</u> WRATE MON		RATEI	MEASURI	NG DE	VICES	<u>OR BV-</u>
			channels OPI ement, effluer			• •			
	1. T	he sampler	flow rate is e	stimated at l	east once	per 4 hou	rs, or		
	O to	DCM Surv	inuous monito veillance requi arable alternat uirement.	irements app	licable to	the inope	rable ch	nannel sł	all apply
Action 29	<u>APPLICA</u>	ABLE FOR	<u>R CONTINUC</u>	US RELEA	<u>SES</u>				
			channels OPI ement, effluer			• · ·			
	gr	-	es (or local mo s are taken; th					-	
	O to	DCM Survey the compa	inuous monito veillance requi arable alternat requirement.	rements app	licable to	the inope	rable ch	annel sł	all apply
			-				• •		
the int case, t	ended mor	nitoring fur onitor can	ons where the laction, but the be read at leas	communica	tions are	lost to the	Contro	l Room.	In this
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1/2-ODC-3.03				
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## ODCM CONTROLS: RETS INSTRUMENT FOR GASEOUS RELEASES

#### TABLE 3.3-13 (continued)

#### **ACTION STATEMENTS**

Action 30A <u>APPLICABLE FOR THE INITIAL BATCH PURGE OF THE BV-1 REACTOR</u> <u>CONTAINMENT</u>

> With the number of channels <u>OPERABLE</u> less than required by minimum Channels OPERABLE requirement, immediately suspend PURGING of Reactor Containment via this pathway if both RM-1VS-104A and B are not OPERABLE with the purge/exhaust system in service. The following should also be noted:

1. As stated, this Action is applicable for INOPERABLE monitors only when performing the initial batch purge of the reactor containment atmosphere (i.e.; immediately after reactor containment atmosphere equalization).

2. Since all other releases of reactor containment atmosphere (i.e.; after the initial batch purge) are considered continuous releases, then this Action is not applicable. Therefore, Action 29 is applicable for INOPERABLE monitors when performing a continuous release of the reactor containment atmosphere.

#### Action 30B <u>APPLICABLE FOR THE INITIAL BATCH PURGE OF THE BV-2 REACTOR</u> <u>CONTAINMENT</u>

With the number of channels OPERABLE less than required by Minimum Channels OPERABLE requirement, immediately suspend PURGING of Reactor Containment via this pathway if both 2HVR-RQ104A and 104B are not OPERABLE with the purge/exhaust system in service. The following should also be noted:

1. As stated, this Action is applicable for INOPERABLE monitors only when performing the initial batch purge of the reactor containment atmosphere (i.e.; immediately after reactor containment atmosphere equalization).

2.

Since all other releases of reactor containment atmosphere (i.e.; after the initial batch purge) are considered continuous releases, then this Action is not applicable. Therefore, Action 29 is applicable for INOPERABLE monitors when performing a continuous release of the reactor containment atmosphere.

#### Action 32 <u>APPLICABLE FOR CONTINUOUS RELEASES</u>

With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue provided samples are continuously collected with auxiliary sampling equipment as required in ODCM Control 3.11.2.1, Table 4.11-2, or sampled and analyzed once every 12 hours.

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	ODCM CONTROLS: RETS INST	ge 9 of 13 FRUMENT	FOR GASEO	US RELI	EASES
		·			
		BLE 4.3-1	<u>3</u>		
	<u>BV-1 RADIOACTIVE GA</u> INSTRUMENTATION S	URVEILLAN	<b>NCE REQUIREM</b>	ENTS	
	Pri = Primary Instrum	ents, Alt = A	Iternate Instrumer	nts	
	i da			CTLAND.	CHANNEI
, :	INSTRUMENT FILTER STATE	CHANNEL CHECK	SOURCE CHECK	CHANN CALIBRA	
L Gas	seous Waste/Process Vent System (PV-1,2)	CILCK	<u>ombok</u>		
. a.	Noble Gas Activity Monitor	<b>P</b>		R ⁽³⁾	$\mathbf{Q}^{(\mathbf{i})}$
	Pri: (RM-1GW-108B)				
	Alt For Continuous Release: (RM-1GW-109 Ch 5) T channel for continuous releases via this pathway.	nis channel ma	iy only be used as the	ie comparab	ie alternate monitoring
	Alt For Batch Releases: (See Action 27): RM-1GW-1 channel for batch releases of the BV-1 GWDT's or the E same automatic isolation function as the primary channel GWDT's or the BV-2 GWST's via this pathway	SV-2 GWST's.	Specifically, SINC	<u>E</u> this chann	el does not perform the
Ь.	Particulate and Iodine Sampler	. W	NA	NA	NA
	Pri: (Filter Paper & Charcoal Cartridge for RM-1GW-10 1st Alt: (Filter Paper & Charcoal Cartridge for RM-1GW				
	2nd Alt: (Continuous collection via RASP Pump) of 3rd Alt: (Grab samples every 12 hours)				. • . •
	· · · · ·	Р	NA	Đ	
c.	System Effluent Flow Rate Measuring Device Pri: (FR-1GW-108) or Alt: (RM-1GW-109 Ch 10)	ŗ	;	, , <b>Ņ</b>	Q
d.	Sampler Flow Rate Measuring Device Used for	· D*	NA	R	$\mathbf{Q}$
	Particulate and Iodine Sample Collection (see 1.b) Pri: (RM-1GW-109 Ch 15) or Alt: (Rotometer: FM-1GW-101, and Vacuum Gauge: PI	,			
2. Au	xiliary Building Ventilation System (VV-1; Also called		ent)		
a.	Noble Gas Activity Monitor	D	M ⁽⁴⁾ ,	R ⁽³⁾	Q ⁽²⁾
	Pri: (RM-1VS-101B) or Alt: (RM-1VS-109 Ch 5)		P ⁽⁴⁾ ***		<b>-</b> , :
b.	Particulate and Iodine Sampler	W	NA	NA	NA
	Pri: (Filter Paper & Charcoal Cartridge for RM-1VS-10 1st Alt: (Filter Paper & Charcoal Cartridge for RM-1VS 2nd Alt: (Continuous collection via RASP Pump) of 3rd Alt: (Grab samples every 12 hours)	9) or -111) or			
<b>c.</b>	System Effluent Flow Rate Measurement Device Pri: (FR-1VS-101) or	D	NA	R	Q
	Alt: (RM-1VS-10) or Alt: (RM-1VS-109 Ch 10)		,		
d.	Sampler Flow Rate Measuring Device Used for Particulate and Iodine Sample Collection (see 2.b) Pri: (RM-1VS-109 Ch 15) or Alt: (Rotometer: FM-1VS-102, and Vacuum Gauge: PI-	D IVS-659)	<b>NA</b>	R	Q
	ing Releases via this pathway. uring purging of Reactor Containment via this pathway.				

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itle:		Unit:		Level Of Use:	· ··· · · -
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ODCM CONTROLS: RETS INSTRU	MENT FOR	<b>GASEOUS</b>	S RELE	ASES	
TABL	E 4.3-13				
BV-1 RADIOACTIVE GASEO INSTRUMENTATION SURV					
Pri = Primary Instruments,	Alt = Alter	nate Instrum	ents		
	CHANNEL	SOURCE			NAL
INSTRUMENT	<u>CHECK</u>	<u>CHECK</u> C	ALIBRA	<u>TION</u> <u>TES1</u>	-
B. Reactor Building/SLCRS (CV-1; Also called Elevated Re	-	M ⁽⁴⁾ ,	R ⁽³⁾	O ⁽²⁾	÷
a. Noble Gas Activity Monitor Pri: (RM-1VS-107B)or	D	P ⁽⁴⁾ ***	K '	Q ^e	
Alt: (RM-1VS-110 Ch 5)		274	274	<b>NT</b> 4	
b. Particulate and Iodine Sampler Pri: (Filter Paper & Charcoal Cartridge for RM-1VS-11 1st Alt: (Filter Paper & Charcoal Cartridge for RM-1V 2nd Alt: (Continuous collection via RASP Pump) ør 3rd Alt: (Grab samples every 12 hours)		NA	NA	NA	
c. System Effluent Flow Rate	D	NA	R	. Q	,
Measuring Device Pri: (FR-1VS-112) or Alt: (RM-1VS-110 Ch 10)					
d. Sampler Flow Rate Measuring Device Used for	D	NA	R	Q	
Particulate and Iodine Sample Collection (see 3.b) Pri: (RM-1VS-110 Ch 15) or Alt: (Rotometer: FM-1VS-103, and Vacuum Gauge: PI-	-1VS-660)				
	,				
				· .	
During releases via this pathway.				-	
**During purging of Reactor Containment via this path	iway.				
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	ODCM CONTROLS: RETS INSTRU		OR GASE	OUS REL	EASES
	<u>TABLE 4.3-</u>				
	BV-2 RADIOACTIVE GASED INSTRUMENTATION SURV				I
	Pri = Primary Instruments,	Alt = A	lternate In:	struments	
	INSTRUMENT	CHANNEL <u>CHECK</u>	SOURCE <u>CHECK</u>	CHANNI <u>CALIBRAT</u>	-
1.SL	CRS Unfiltered Pathway (VV-2; Also called Ventilat	ion Vent)			
a.	Noble Gas Activity Monitor Pri: (2HVS-RQ101B)	D	M ⁽⁴⁾ , P ⁽⁴⁾ ***	R ⁽³⁾⁽⁶⁾	Cashada (1997) (1997) 
b.	Particulate and Iodine Sampler	W	NA	NA	NA
	Pri: (Filter Paper & Charcoal Cartridge for 2HVS-RQ1 1st Alt: (Continuous collection via RASP Pump) or 2nd Alt: (Grab samples every 12 hours)	01) or	;		
c.	Process Flow Rate Monitor Pri: (Monitor Item 29 for 2HVS-VP101)	D	NA	<u>.</u> R	Q
d.	Sampler Flow Rate Monitor Used for Particulate and Iodine Sample Collection (see 1.b)	<b>D</b>	NA	R	Q
2 61 /	Pri: (2HVS-FIT101) CRS Filtered Pathway (CV-2; Also called Elevated R	: (azasla			
2. SL a.	Noble Gas Activity Monitor Pri: (2HVS-RQ109B)	D	M ⁽⁴⁾ , P ⁽⁴⁾ ***	R ⁽³⁾⁽⁶⁾	Q ⁽⁵⁾
Ъ.	Particulate and Iodine Sampler Pri: (Filter Paper & Charcoal Cartridge for 2HVS-RQI 1st Alt: (Continuous collection via RASP Pump) or 2nd Alt: (Grab samples every 12 hours)	W 09 High Flo	NA w Path) or	NA	NA
c.	Process Flow Rate Monitor Pri: (Monitor Item 29 for 2HVS-FR22) or 1st Alt: (2HVS-FI22A and FI22C) or 2nd Alt: (2HVS-FI22B and FI22D)	D	NA	R	Q -
d.	Sampler Flow Rate Monitor Used for Particulate and Iodine Sample Collection (see 2.b) Pri: (Monitor Items 28 and 72 for 2HVS-DAU109B)	D	NA	<b>R</b> .,	α
	contamination Building Vent (DV-2) Noble Gas Activity Monitor Pri: (2RMQ-RQ301B)	D	M ⁽⁴⁾	R ⁽³⁾⁽⁶⁾	Q ⁽³⁾
b.	Particulate and Iodine Sampler	W	NA	NA	NA
	Pri: (Filter Paper & Charcoal Cartridge for 2RMQ-RQ 1st Alt: (Continuous collection via RASP Pump) or 2nd Alt: (Grab samples every 12 hours)	301) or			
c.	Process Flow Rate Monitor	NA	NA	NA	NA
d.	Sampler Flow Rate Monitor Used for Particulate and Iodine Sample Collection (see 3.b) Pri: (2RMQ-FIT301)	D	NA	R	Q

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### ODCM CONTROLS: RETS INSTRUMENT FOR GASEOUS RELEASES

#### TABLE 4.3-13 (continued)

## **BV-2 RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS**

Pri = Primary Instruments, Alt = Alternate Instruments

	<b>INSTRUMENT</b>	CHANNEL <u>CHECK</u>	SOURCE <u>CHECK</u>	CHANNEL CALIBRATION	FUNCTIONAL <u>TEST</u>
4. Co	ndensate Polishing Building Vent (CB-2)				
8.	Noble Gas Activity Monitor Pri: (2HVL-RQ112B)	D	M ⁽⁴⁾	R ⁽³⁾⁽⁶⁾	Q ⁽⁵⁾
Ь.	Particulate and Iodine Sampler Pri: (Filter Paper & Charcoal Cartridge for 2HVL-RQ 1st Alt: (Continuous collection via RASP Pump) or 2nd Alt: (Grab samples every 12 hours)	W 112) or	NA	NA	NA
c.	Process Flow Rate Monitor	NA	NA	NA	NA
d.	Sampler Flow Rate Monitor Used for Particulate and Iodine Sample Collection (see 4.b) Pri: (2HVL-FIT112)	D	NA	R	Q (
5. Wa	aste Gas Storage Vault Vent (WV-2)			1. A.	
a.	Noble Gas Activity Monitor Pri: (2RMQ-RQ303B)	D	M ⁽⁴⁾	R ⁽³⁾⁽⁶⁾	Q ⁽⁵⁾
b.	Particulate and Iodine Samples Pri: (Filter Paper & Charcoal Cartridge for 2RMQ-RQ 1st Alt: (Continuous collection via RASP Pump) or 2nd Alt: (Grab samples every 12 hours)	W 303) or	NA	NA	NA
Ċ.	Process Flow Rate Monitor	NA	NA	NA_	NA
d.	Sampler Flow Rate Monitor Used for Particulate and Iodine Sample Collection (see 5.b) Pri: (2RMQ-FIT303)	D	NA	R	Q
				:	
		1. ¹	· · · · · · · · · · · · · · · · · · ·	n na na na na na na na na na na	· · ·

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	ATTACHMENT F Page 13 of 13 ODCM CONTROLS: RETS INSTRUMENT FOR GAS		47 of 79
		LUUS KL	LEASES
	TABLE 4.3-13 (continued)	·	
(1)	TABLE NOTATION		
(1)	The CHANNEL FUNCTIONAL TEST shall also demonstrate pathway and Control Room Alarm Annunciation occurs if any		•
	<ul><li>a. Instrument indicates measured levels above the alarm/tr</li><li>b. Downscale failure.</li></ul>	rip setpoin	t.
	c. Instrument controls not set in operate mode.	,	
(2)	The CHANNEL FUNCTIONAL TEST shall also demonstrate Annunciation occurs if any of the following conditions exist:	that Contro	ol Room Alarm
	<ul><li>a. Instrument indicates measured levels above the alarm/tr</li><li>b. Downscale failure.</li></ul>	rip setpoin	t.
	c. Instrument controls not set in operate mode.		
(3)	<ul> <li>c. Instrument controls not set in operate mode.</li> <li>The initial CHANNEL CALIBRATION for radioactivity meass performed using one or more of the reference standards certifie or using standards that have been obtained from suppliers that passurance activities with NBS. These standards should permit intended range of energy and rate capabilities. For subsequent sources that have been related to the initial calibration should be per 18 months. This can normally be accomplished during refu</li> </ul>	d be Natio participate calibrating CHANNE e used, at	onal Bureau of Standar in measurement the system over its L CALIBRATION, intervals of at least on
(3) (4)	The initial CHANNEL CALIBRATION for radioactivity meas performed using one or more of the reference standards certifie or using standards that have been obtained from suppliers that assurance activities with NBS. These standards should permit intended range of energy and rate capabilities. For subsequent sources that have been related to the initial calibration should b	d be Natio participate calibrating CHANNE ie used, at ieling outa means or f	onal Bureau of Standar in measurement the system over its EL CALIBRATION, intervals of at least on ges. lashing the detector
	The initial CHANNEL CALIBRATION for radioactivity meass performed using one or more of the reference standards certifie or using standards that have been obtained from suppliers that p assurance activities with NBS. These standards should permit intended range of energy and rate capabilities. For subsequent sources that have been related to the initial calibration should b per 18 months. This can normally be accomplished during refu A SOURCE CHECK may be performed utilizing the installed with a portable source to obtain an upscale increase in the exist	d be Natio participate calibrating CHANNE be used, at ueling outa means or f ing count that Contro	onal Bureau of Standar in measurement the system over its L CALIBRATION, intervals of at least on ges. lashing the detector rate to verify channel
(4)	The initial CHANNEL CALIBRATION for radioactivity meass performed using one or more of the reference standards certifie or using standards that have been obtained from suppliers that p assurance activities with NBS. These standards should permit intended range of energy and rate capabilities. For subsequent sources that have been related to the initial calibration should b per 18 months. This can normally be accomplished during refu A SOURCE CHECK may be performed utilizing the installed with a portable source to obtain an upscale increase in the exist response. The CHANNEL FUNCTIONAL TEST shall also demonstrate	d be Natio participate calibrating CHANNE e used, at reling outa means or f ing count that Contro s above th	onal Bureau of Standar in measurement the system over its L CALIBRATION, intervals of at least on ges. lashing the detector rate to verify channel ol Room Alarm e alarm/trip setpoint.
(4)	The initial CHANNEL CALIBRATION for radioactivity meass performed using one or more of the reference standards certifie or using standards that have been obtained from suppliers that p assurance activities with NBS. These standards should permit intended range of energy and rate capabilities. For subsequent sources that have been related to the initial calibration should b per 18 months. This can normally be accomplished during refu A SOURCE CHECK may be performed utilizing the installed with a portable source to obtain an upscale increase in the exist response. The CHANNEL FUNCTIONAL TEST shall also demonstrate Annunciation occurs if the instrument indicates measured level The CHANNEL CALIBRATION shall also demonstrate that C	d be Natio participate calibrating CHANNE e used, at reling outa means or f ing count that Contro s above th	onal Bureau of Standar in measurement the system over its L CALIBRATION, intervals of at least on ges. lashing the detector rate to verify channel ol Room Alarm e alarm/trip setpoint.
(4)	<ul> <li>The initial CHANNEL CALIBRATION for radioactivity meass performed using one or more of the reference standards certified or using standards that have been obtained from suppliers that passurance activities with NBS. These standards should permit intended range of energy and rate capabilities. For subsequent sources that have been related to the initial calibration should be per 18 months. This can normally be accomplished during refu</li> <li>A SOURCE CHECK may be performed utilizing the installed with a portable source to obtain an upscale increase in the exist response.</li> <li>The CHANNEL FUNCTIONAL TEST shall also demonstrate Annunciation occurs if the instrument indicates measured level The CHANNEL CALIBRATION shall also demonstrate that Coccurs if either of the following conditions exist:</li> <li>1. Downscale failure.</li> </ul>	d be Natio participate calibrating CHANNE e used, at reling outa means or f ing count that Contro s above th	onal Bureau of Standar in measurement the system over its L CALIBRATION, intervals of at least on ges. lashing the detector rate to verify channel ol Room Alarm e alarm/trip setpoint.
(4)	<ul> <li>The initial CHANNEL CALIBRATION for radioactivity meass performed using one or more of the reference standards certified or using standards that have been obtained from suppliers that passurance activities with NBS. These standards should permit intended range of energy and rate capabilities. For subsequent sources that have been related to the initial calibration should be per 18 months. This can normally be accomplished during refu</li> <li>A SOURCE CHECK may be performed utilizing the installed with a portable source to obtain an upscale increase in the exist response.</li> <li>The CHANNEL FUNCTIONAL TEST shall also demonstrate Annunciation occurs if the instrument indicates measured level The CHANNEL CALIBRATION shall also demonstrate that Coccurs if either of the following conditions exist:</li> <li>1. Downscale failure.</li> </ul>	d be Natio participate calibrating CHANNE e used, at reling outa means or f ing count that Contro s above th	onal Bureau of Standar in measurement the system over its L CALIBRATION, intervals of at least on ges. lashing the detector rate to verify channel ol Room Alarm e alarm/trip setpoint.

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CONTROLS: LIQUID EFFLUENT CONCENTRATION					
3.11.1.1 In accordance with BV-1 and BV-2 Technical Spe concentration of radioactive material released at an 2.01, Figure 5-1) shall be limited to 10 times the E Appendix B (20.1001-20.2401), Table 2, Column or entrained noble gases. This is referred to as the (OEC). For dissolved or entrained noble gases, the uCi/ml total activity.	ny time from the C's specified in 2 for radionucli ODCM Effluer	e site (see 1/2-ODC- 10 CFR Part 20, des other than dissolve at Concentration Limit			
Applicability: At all times.					
Action:					
a. With the concentration of radioactive material released from exceeding the above limits; immediately restore the conce					
b. Submit a Special Report to the Commission within 30 day 20.2203(a)(2)(v) and 10 CFR 50.4(b)(1).	s in accordance	with 10 CFR			
c. The provisions of ODCM CONTROL 3.0.3 are not applic	able.				
SURVEILLANCE REQUIREMENTS					
4.11.1.1.1 Radioactive liquid wastes shall be sampled and an analysis program of ODCM Control 3.11.1.1, Tabl	•	g to the sampling and			
4.11.1.1.2 The results of radioactive analysis shall be used in assure that the concentration at the point of release ODCM CONTROL 3.11.1.1.					
4.11.1.1.3 When BV-1 primary to secondary leakage exceeds Turbine Building Sump shall be obtained every 8 h Building Sump concentration does not exceed 1 O is reached, the Turbine Building Sump shall be rou	hours to ensure EC. Once it is a	that the Turbine letermined that an OE			
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	Beaver V	Valley Power Station			1/2-0	<u>ODC-3.0</u>
Title:		······		Unit: 1/2	Lev	vel Of Use: eneral Ski
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		CONTROLS: LIQUID EFFLUENT	CONCE	NIRAI	ION	
SURVEILL	ANCE REQU	JIREMENTS (continued)				
4.11.1.1.4 [°]	Turbine B Building S is reached,	-2 primary to secondary leakage excer uilding Sump shall be obtained every Sump concentration does not exceed 1 , the Turbine Building Sump shall be (2SGC-TK21A or 2SGC-TK21B).	8 hours t OEC. C	o ensure Ince it is	e that t deter	the Turb mined th
4.11.1.1.5	basin 16, a sensitivity	e BV-2 Recirculation Drain Pump(s) a grap sample will be taken. The sam of at least 1E-7 uCi/ml. Water volur pump operations unless alternate flow	ples will ne discha	be analy rged sha	zed fo all be e	or gross estimate
		•				
		•				
	·					
as specified i	in ODCM SUR	es are normally via batch modes. BV-1 and E VEILLANCE REQUIREMENT 4.11.1.1.3 a nitored as specified in ODCM SURVEILLA	nd 4.11.1.1	.4. The E	3V-2 Re	ecirculation
as specified i	in ODCM SUR	VEILLANCE REQUIREMENT 4.11.1.1.3 a	nd 4.11.1.1	.4. The E	3V-2 Re	ecirculation
as specified i	in ODCM SUR	VEILLANCE REQUIREMENT 4.11.1.1.3 a	nd 4.11.1.1	.4. The E	3V-2 Re	ecirculation
as specified i	in ODCM SUR	VEILLANCE REQUIREMENT 4.11.1.1.3 a	nd 4.11.1.1	.4. The E	3V-2 Re	ecirculation
as specified i	in ODCM SUR	VEILLANCE REQUIREMENT 4.11.1.1.3 a	nd 4.11.1.1	.4. The E	3V-2 Re	ecirculation
as specified i	in ODCM SUR	VEILLANCE REQUIREMENT 4.11.1.1.3 a	nd 4.11.1.1	.4. The E	3V-2 Re	ecirculation
as specified i	in ODCM SUR	VEILLANCE REQUIREMENT 4.11.1.1.3 a	nd 4.11.1.1	.4. The E	3V-2 Re	ecirculation
as specified i	in ODCM SUR	VEILLANCE REQUIREMENT 4.11.1.1.3 a	nd 4.11.1.1	.4. The E	3V-2 Re	ecirculation
as specified i	in ODCM SUR	VEILLANCE REQUIREMENT 4.11.1.1.3 a	nd 4.11.1.1	.4. The E	3V-2 Re	ecirculation
as specified i	in ODCM SUR	VEILLANCE REQUIREMENT 4.11.1.1.3 a	nd 4.11.1.1	.4. The E	3V-2 Re	ecirculation
as specified i	in ODCM SUR	VEILLANCE REQUIREMENT 4.11.1.1.3 a	nd 4.11.1.1	.4. The E	3V-2 Re	ecirculation
as specified i	in ODCM SUR	VEILLANCE REQUIREMENT 4.11.1.1.3 a	nd 4.11.1.1	.4. The E	3V-2 Re	ecirculation
as specified i	in ODCM SUR	VEILLANCE REQUIREMENT 4.11.1.1.3 a	nd 4.11.1.1	.4. The E	3V-2 Re	ecirculation

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# TABLE 4.11-1

# RADIOACTIVE LIQUID WASTE SAMPLING AND ANALYSIS PROGRAM

		· · · · · · · · · · · · · · · · · · ·	
· .	1		LOWER
· · · ·	MINIMUM	TYPE OF	LIMIT OF
SAMPLING	ANALYSIS	ACTIVITY	DETECTION
FREQUENCY	FREQUENCY	ANALYSIS	(LLD)
			(uCi/ml) ^(a)
Р	Р	Principal Gamma	5E-7
Each Batch ^(h)	Each Batch ^(h)	Emitters ^(f)	
		I-131	1E-6
Р	M	Dissolved And	1E-5
One		Entrained Gases	
Batch/M ^(h)		(Gamma Emitters)	
Р	М	H-3	1E-5
Each Batch ^(h)	Composite ^(b)	Gross Alpha	1E-7
Р	Q	Sr-89, Sr-90	5E-8
Each Batch ^(h)	Composite ^(b)	Fe-55	1E-6
Grab Sample ^(g)	W	Principal Gamma	5E-7
	Composite ^(c)	Emitters ^(f)	
_	1	I-131	1E-6
Grab Sample ^(g)	M	Dissolved And	1E-5
		Entrained Gases	
		(Gamma Emitters)	
Grab Sample ^(g)	Μ	H-3	1E <b>-</b> 5
	Composite ^(c)	Gross Alpha	1E-7
Grab Sample ^(g)	Q	Sr-89, Sr-90	5E-8
-	Composite ^(c)	Fe-55	1E-6
	FREQUENCY P Each Batch ^(h) P One Batch/M ^(h) P Each Batch ^(h) Grab Sample ^(g) Grab Sample ^(g)	SAMPLING FREQUENCYANALYSIS FREQUENCYPPEach Batch(h)PPMOne Batch/M(h)MPMComposite(h)Composite(h)PQEach Batch(h)Composite(h)Grab Sample(g)WGrab Sample(g)MGrab Sample(g)MGrab Sample(g)MGrab Sample(g)MGrab Sample(g)MComposite(c)MGrab Sample(g)MGrab Sample(g)MGrab Sample(g)MComposite(c)MGrab Sample(g)MGrab Sample(g)MGrab Sample(g)MGrab Sample(g)MGrab Sample(g)MGrab Sample(g)MGrab Sample(g)MGrab Sample(g)MGrab Sample(g)MGrab Sample(g)M	SAMPLING FREQUENCYMINIMUM ANALYSIS FREQUENCYTYPE OF ACTIVITY ANALYSISP Each Batch (h)P Each Batch (h)Principal Gamma Emitters (i)P Date (h)P Each Batch (h)Principal Gamma Emitters (i)P Each Batch (h)MDissolved And Entrained Gases (Gamma Emitters)P Each Batch (h)M Composite (b)H-3 Gross AlphaP Each Batch (h)QSr-89, Sr-90 

÷.,

Title:

(a)

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## ATTACHMENT G Page 4 of 5 ODCM CONTROLS: LIQUID EFFLUENT CONCENTRATION

#### TABLE 4.11-1 (continued)

#### **TABLE NOTATION**

The LLD is the smallest concentration of radioactive material in a sample that will be detected with 95% probability with 5% probability of falsely concluding that a blank observation represents a "real" signal.

For a particular measurement system (which may include radiochemical separation):

 $LLD = \frac{4.66 \text{ Sb}}{(E)(V)(2.22)(Y) \exp(-\lambda\Delta T)}$ 

where:

LLD is the lower limit of detection as defined above (as pCi per unit mass or volume);

 $S_b$  is the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate (as counts per minute);

E is the counting efficiency (as counts per transformation);

V is the sample size (in units of mass or volume);

2.22 is the number of transformations per minute per picocurie;

Y is the fractional radiochemical yield (when applicable);

 $\lambda$  is the radioactive decay constant for the particular radionuclide;

 $\Delta T$  is the elapsed time between sample collection (or end of the sample collection period) and time of counting (for environmental samples, not plant effluent samples).

The value of  $S_b$  used in the calculation of the LLD for a detection system shall be based on the actual observed variance of the background counting rate or of the counting rate of the blank samples (as appropriate) rather than on an unverified theoretically predicted variance. Typical values of E, V, Y and  $\Delta T$  should be used in the calculations.

The LLD is defined as an <u>a priori</u> (before the fact) limit representing the capability of a measurement system and not as <u>a posteriori</u> (after the fact) limit for a particular measurement.

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## ATTACHMENT G Page 5 of 5 ODCM CONTROLS: LIQUID EFFLUENT CONCENTRATION

#### TABLE 4.11-1 (continued)

#### **TABLE NOTATION**

- ^(b) A composite sample is one in which the quantity of liquid sampled is proportional to the quantity of liquid waste discharged and in which the method of sampling employed results in a specimen which is representative of the liquids released.
- ^(c) To be representative of the quantities and concentrations of radioactive materials in liquid effluents, samples shall be collected continuously in proportion to the rate of flow of the effluent stream. Prior to analyses, all samples taken for the composite shall be thoroughly mixed in order for the composite sample to be representative of the effluent release.
- ^(d) A batch release exists when the discharge of liquid wastes is from a discrete volume. Prior to sampling for analyses, each batch shall be isolated, and then thoroughly mixed to assure representative sampling.
- ^(e) A continuous release exists when the discharge of liquid wastes is from a non-discrete volume; e.g., from a volume of a system having an input flow during the continuous release. Releases from the Turbine Building Drains and the AFW Pump Bay Drain System and Chemical Waste Sump are considered continuous when the primary to secondary leak rate exceeds 0.1 gpm (142 gpd).
- (f) The principal gamma emitters for which the LLD specification will apply are exclusively the following radionuclides: Mn-54, Fe-59, Co-58, Co-60, Zn-65, Mo-99, Cs-134, Cs-137, Ce-141, and Ce-144. This list does not mean that only these nuclides are to be detected and reported. Other peaks which are measurable and identifiable, together with the above nuclides, shall also be identified and reported. Nuclides which are below the LLD for the analyses should be reported as "less than" the nuclide's LLD, and should not be reported as being present at the LLD level for that nuclide. The "less than" values should not be used in the required dose calculations. When unusual circumstances result in LLD's higher than required, the reasons shall be documented in the Annual Radioactive Effluent Release Report.
  - When radioactivity is identified in the secondary system, a RWDA-L should be prepared on a monthly basis to account for the radioactivity that will eventually be discharged to the Ohio River.
  - Whenever the BV-2 Recirculation Drain Pump(s) are discharging to catch basin 16, sampling will be performed by means of a grab sample taken every 4 hours during pump operation.

Title:

(g)

(h)

E	Beaver Valley Power Station	Procedure Nu	mber: 1/2-ODC-3.03
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	ATTACHMENT H Page 1 of 1		
	ODCM CONTROLS: LIQUID EFFLUE	NT DOSE	
CONTROLS:	LIQUID EFFLUENT DOSE		
3.11.1.2	In accordance with BV-1 and BV-2 Technical Specif dose or dose commitment to MEMBER(S) OF THE in liquid effluents released from the reactor unit (see limited:	PUBLIC from	radioactive materials
	a. During any calendar quarter to less than or ec to less than or equal to 5 mrem to any organ,		m to the total body and
	b. During any calendar year to less than or equa less than or equal to 10 mrem to any organ.	l to 3 mrem to	the total body and to
Applicability:	At all times.		
Action:	· · · · · · · · · · · · · · · · · · ·		
any of CFR 2 exceed the pro above the dri	the calculated dose from the release of radioactive mathematical the above limits, prepare and submit to the Commission $(2.2203(a)(2)(v))$ and 10 CFR 50.4(b)(1), a Special Repling the limit(s) and defines the corrective actions to be posed corrective actions to be taken to assure the sublimits. (This Special Report shall also include (1) the nking water source and (2) the radiological impact on egard to the requirements of 40 CFR 141, Safe Drinking	ion within 30 c port which iden be taken to redu sequent release results of radi finished drink	lays, pursuant to 10 ntifies the cause(s) for uce the releases, and es will be within the ological analyses of ing water supplies
b. The pr	rovisions of ODCM CONTROL 3.0.3 are not applicab	le.	-
SURVEILLA	NCE REQUIREMENTS		
4.11.1.2.1	<u>Dose Calculations</u> . Cumulative dose contributions findetermined in accordance with 1/2-ODC-2.01 at leas	· •	
	only if drinking water supply is taken from the receiving charge (three miles downstream only).	ng water body	within three miles of

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	Beaver Valley Power Station	Procedure N	umber: 1/2-ODC-3.03
litle:		Unit: 1/2	Level Of Use: General Skill Reference
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	ATTACHMENT I		
	Page 1 of 1 ODCM CONTROLS: LIQUID RADWASTE TRE	EATMENT SY	STEM
CONTROL	S: LIQUID RADWASTE TREATMENT SYSTEM		
3.11.1.3	In accordance with BV-1 and BV-2 Technical Spec Radwaste Treatment System shall be used to reduce liquid waste batch prior to its discharge when the p releases from the reactor unit (see 1/2-ODC-2.01 F would exceed 0.06 mrem to the total body or 0.2 m	e the radioactiv rojected doses igure 5-1) when	e materials in each due to liquid effluent n averaged over 31 days
Applicabilit	y: At all times.		
Action:			
and s	liquid waste being discharged without treatment and submit to the Commission within 30 days pursuant to (b)(1) a Special Report which includes the following in	10 CFR 20.220	
1.	Identification of the inoperable equipment or subsy	stems and the r	eason for inoperability
2.	Action(s) taken to restore the inoperable equipment	to operational	status, and
3.	Summary description of action(s) taken to prevent a	a recurrence.	
b. The j	provisions of ODCM CONTROL 3.0.3 are not applica	ıble.	
SURVEILLA	ANCE REQUIREMENTS	•	
4.11.1.3.1	Doses due to liquid releases shall be projected at lea with 1/2-ODC-2.01.	ast once per 31	days, in accordance
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	Beaver Valley Power Station	Procedure N	umber: 1/2-ODC-3.03
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	ODCM CONTROLS: LIQUID HOLD	UP TANKS	
CONTROL	S: LIQUID HOLDUP TANKS		
3.11.1.4	In accordance with BV-1 and BV-2 Technical Spe	cification 6.8.60	, the quantity of
14.14	radioactive material contained in each of the follow		1 (š. s. 1
	listed below, excluding tritium and dissolved or en		ases.
	<ul> <li>a. ≤21 Curies: 1BR-TK-6A (Unit 1 Primary Water S</li> <li>b. ≤21 Curies: 1BR-TK-6B (Unit 1 Primary Water S</li> </ul>		
	c. $\leq$ 7 Curies: 1LW-TK-7A (Unit 1 Steam Generator	Drain Tank)	
	<ul> <li>d. ≤7 Curies: 1LW-TK-7B (Unit 1 Steam Generator)</li> <li>e. ≤5 Curies: 1QS-TK-1 (Unit 1 Refueling Water Store)</li> </ul>		ጥነ
	e. ≤ 5 Curies: 1QS-TK-1 (Unit 1 Refueling Water Sto f. ≤ 139 Curies: 2QSS-TK21 (Unit 2 Refueling Wate	0	,
	g. $\leq$ 10 Curies: Unit 1 and 2 miscellaneous temporary	-	-
APPLICAB	ILITY: At all times.		
ACTION:			· .
a. With the	quantity of radioactive material in the tank exceeding the	limit, perform ca	culations to determine
compliar	nce to the limits of 10 CFR Part 20, Appendix B, Table 2, 0	Column 2. These	calculations shall be
	ed at the nearest potable water supply, and the nearest surfate he entrance to the Midland Water Treatment Facility). IF the second sec		
	hed to be exceeded, <u>THEN</u> immediately suspend all additio		
within 43	8 hours reduce the tank contents to within the limits set for	th in 10 CFR Par	t 20, and
	Special Report in accordance with 10 CFR 50.4 (b) (1) with a special report of a structure to a special the structure to a special the special		
Part 20.	on of activities planned and/or taken to reduce the contents	s to within the lin	nus set forth in 10 CFR
	visions ODCM Control 3.0.3 are not applicable.		-
-	••	· .	
SURVEILL	ANCE REQUIREMENTS	· 4	
			· · · ·
<u>~</u> ·	The quantity of radioactive material contained in each		· •
4.11.1.4.1	I and 2 DWST'a) shall be determined to be within the		anyzing a representative.
4.11.1.4.1	1 and 2 RWST's) shall be determined to be within the a sample of the tank's contents at least once per 7 days w		
4.11.1.4.1	1 and 2 RWST's) shall be determined to be within the a sample of the tank's contents at least once per 7 days w to the tank.		
4.11.1.4.1	sample of the tank's contents at least once per 7 days w to the tank. <u>SINCE</u> additions of radioactive material to the Unit 1/a	hen radioactive r and 2 RWST's are	naterials are being added e normally made at the
	sample of the tank's contents at least once per 7 days w to the tank. <u>SINCE</u> additions of radioactive material to the Unit 1 a end of a refueling outage (i.e.; drain down of the reactor	hen radioactive r and 2 RWST's are	naterials are being added e normally made at the
	sample of the tank's contents at least once per 7 days w to the tank. <u>SINCE</u> additions of radioactive material to the Unit 1 a end of a refueling outage (i.e.; drain down of the reactor compliance to this limit shall be performed as follows:	hen radioactive r and 2 RWST's are or cavity back to t	naterials are being added e normally made at the the RWST), <u>THEN</u>
	sample of the tank's contents at least once per 7 days w to the tank. <u>SINCE</u> additions of radioactive material to the Unit 1 a end of a refueling outage (i.e.; drain down of the reactor	hen radioactive r nd 2 RWST's are or cavity back to f nit 1 and 2 RWS	naterials are being added e normally made at the the RWST), <u>THEN</u> T's shall be determined t

	Beaver Valley Power Station	Procedure N	Procedure Number: 1/2-ODC-3.03		
Title:		Unit: Level Of Use:			
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	ATTACHMENT K				
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	ODCM CONTROLS: GASEOUS EFFLUEN	NI DOSE KAI	E		
CONTROLS	S: GASEOUS EFFLUENT DOSE RATE		۰÷۰. 		
3.11.2.1	In accordance with BV-1 and BV-2 Technical Spee dose rate in the unrestricted areas (see 1/2-ODC-2. materials released in gaseous effluents from the site values: a. The dose rate limit for noble gases shall be ≤	02 Figure 5-1) e shall be limite	due to radioactive ed to the following		
	3000 mrem/yr to the skin*, and		· · ·		
	b. The dose rate limit, inhalation pathway only, radionuclides in particulate form (excluding eight days shall be $\leq 1500$ mrem/yr to any or	C-14) with half			
Applicability	Y: At all times.				
Action:					
	he dose rate(s) exceeding the above limits, immediate he above limits(s), and	ly decrease the	release rate to comply		
	t a Special Report to the Commission within 30 days CFR 50.4(b)(1).	pursuant to 10	CFR 20.2203(a)(2)(v)		
c. The pr	ovisions of ODCM CONTROL 3.0.3 are not applicab	le.			
SURVEILL	ANCE REQUIREMENTS		•		
4.11.2.1.1	The dose rate due to noble gaseous effluents shall be limits in accordance with 1/2-ODC-2.02.	be determined t	o be within the above		
4.11.2.1.2	The dose rate, inhalation pathway only, for I-131, t particulate form (excluding C-14) with half-lives g effluents, shall be determined to be within the above methods and procedures of the ODCM by obtaining	reater than eigh e limits in acco	t days in gaseous ordance with the		

*During containment purge the dose rate may be averaged over 960 minutes.

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Beaver Valley Power Station				nit:	1/2-ODC-3.03 Level Of Use:
				1/2	General Skill Refere
DDCM: Controls for RET	'S and REMP Pro	ograms	R	evision:	Page Number:
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		Page 2 of 5	IK		
ODC	M CONTROLS:	υ,	FEI HENT DOS	F R A 1	rr ·
	WI CONTROLD.	UNDECCO EI	PLOLICI DOC		
		<u>TABLE 4.11</u>	<u>-2</u>		
RADIOACTIV	<u>'E GASEOUS W</u>	ASTE SAMPL	ING AND ANA	ALYSI	<u>S PROGRAM</u>
		MINIMUM	ТҮРЕ	]	LOWER LIMIT OF
GASEOUS	SAMPLING	ANALYSIS	OF		DETECTION
RELEASE	FREQUENCY	FREQUENCY	ACTIVITY		(LLD)
ТҮРЕ			ANALYSIS		(uCi/ml) ^(a)
A. Waste Gas Storage	Р	P	Principal		1E-4
Tank	Each Tank	Each Tank	Gamma		•
	Grab Sample		Emitters ^(g)		· · · · · · · · · · · · · · · · · · ·
	Each Tank*	Each Tank*	H-3*		1E-6
	Grab Sample				
B. Containment Purge	P Each Purge ^(b)	P Each Purge ^(b)	Principal Gami Emitters ^(g)	ma	1E-4
	Grab Sample	Each Purge	H-3		1E-6
	$M^{(b)(c)(e)}$	•			
C. Ventilation		M ^(b)	Principal Gam	ma	1E-4
Systems ^(h) VV-1 (UI PAB/Ventilation Vent)	Grab Sample		Emitters ^(g)		
CV-1 (U1 Rx Cont/SLCRS Vent)		-	H-3		1E-6
PV-1/2 (U1/2 GW/Process Vent)			•		
VV-2 (U2 SLCRS Unfiltered Path) CV-2 (U2 SLCRS Filtered Path)					
DV-2 (U2 Decon Bldg Vent)					
WV-2 (U2 Waste Gas Vault Vent) CB-2 (U2 Cond Pol Bldg Vent)		· · · ·			
L	L	······································	L		· · · · · · · · · · · · · · · · · · ·

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Beaver	Valley Pov	ver Statior	n l		rocedure Number: 1/2-ODC-3.03		
Title: Uni			Unit: 1/2	Level Of Use: General Skill Refe	erence		
DCM: Controls for R	ETS and REMP F	Programs	ľ	Revision:	Page Number:	7	
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OI	OCM CONTROLS			SE RATI	7		
	1	<u>ABLE 4.11-2 (</u>	continued)				
RADIOACT	TVE GASEOUS	WASTE SAMI	PLING AND AN	IALYSIS	PROGRAM		
		MINIMUM	TYPE	LO	WER LIMIT OF	ך	
GASEOUS	SAMPLING	ANALYSIS	OF	1	DETECTION		
RELEASE	FREQUENCY	FREQUENCY	ACTIVITY		(LLD)		
ТҮРЕ			ANALYSIS		(uĈi/ml) ^(a)		
D. All Ventilation	Continuous ^(f)	W ^(d)	I-131		1E-12		
Systems Listed		1	I-133		1E-10		
Above (in C.)		Sample					
Which Produce	Continuous ^(f)	W ^(d)	Dringing 1 Com		1E-11	-	
Continuous	Continuous	Particulate	Principal Gam Emitters ^(g)	na	16-11		
Release		Sample	(I-131, Others)				
	Continuous ^(f)	M	Gross Alpha	/	1E-11	-{	
	Continuous	Composite	GIUSS Aiplia		<u></u>		
		Particulate					
		Sample					
	Continuous ^(f)	Q	Sr-89, Sr-90		1E-11		
		Composite	t				
		Particulate					
		Sample			· · · · · · · · · · · · · · · · · · ·	_	
	Continuous ⁽¹⁾	Noble Gas	Noble Gases		1E-6		
		Monitor	Gross Beta And				
L		l	Gamma			ŀ	
					<b>•</b>		
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	Beaver Valley Power Station	Procedure Nu	mber: 1/2-ODC-3.03
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			- ·
	<u>TABLE 4.11-2 (continued)</u> <u>TABLE NOTATION</u>		
	<u>IADLE NOTATION</u>		na da serie da Anglanda Anglanda serie da Anglanda
(a)	The Lower Limit of Detection (LLD) is defined in Table Notation (a) of 1 for ODCM Surveillance Requirement 4.11.1.1.	f ODCM Cor	ntrol 3.11.1.1, Table 4.11-
(b)	Samples (grab particulate, iodine & noble gas) and analysis shall also be STARTUP, or a THERMAL POWER change exceeding 15% of RATE hour period. This requirement does not apply if (1) analysis shows that concentration in the primary coolant has not increased more than a factor shows that effluent activity has not increased more than a factor of 3.	ED THERMA the Dose Eq	AL POWER within a 1 uivalent I-131
	<b><u>Clarification</u></b> : All samples shall be obtained within 24 hours of reaching and analyzed within 48 hours of reaching the intended steady state power	-	d steady state power level,
	Applicability: Unit 1 Ventilation Systems (VV-1, CV-1 and/or PV-1/2) CV-2 and/or PV-1/2), as appropriate. Specifically, sample the ventilation 3 increase on the noble gas effluent monitor. ^(3,1,16) (3,1,18)		
(c)	Tritium grab samples shall be taken at least once per 24 hours (from the the refueling canal area) when the containment refueling canal is floode completion of vessel defueling. Sampling shall resume upon commence	d. Sampling	may be terminated after
	<u>Applicability - (Mode 6):</u> Unit 1 Ventilation System (VV-1 or CV-1), CV-2), that is aligned to the Reactor Containment Building atmosphere release path, samples may be obtained from the Reactor Containment B	In lieu of sa	ampling the ventilation
(d)	Part 1: Samples (continuous particulate & iodine) shall be changed at le be completed within 48 hours after changing, or after removal from same	-	7 days and analyses shall
	Applicability for Part 1: Unit 1 and Unit 2 Ventilation Systems (VV-1 WV-2 & CB-2).	, CV-1, PV-3	1/2, VV-2, CV-2, DV-2,
	<b>Part 2:</b> Samples (continuous particulate & iodine) shall also be changed 7 days following each SHUTDOWN, STARTUP, or THERMAL POW THERMAL POWER within a 1 hour period and analyses shall be comp When samples collected for 24 hours are analyzed, the corresponding L 10. This requirement does not apply if: (1) analysis shows that the DO concentration in the reactor coolant has not increased more than a factor of 3.	ER change e bleted within LDs may be SE EQUIVA	exceeding 15% of RATED 48 hours of changing. increased by a factor of LENT I-131
	<u>Clarification</u> : All samples shall be changed within 24 hours of reaching and analyzed within 48 hours of reaching the intended steady state power	-	d steady state power level
	<u>Applicability for Part 2:</u> Unit 1 Ventilation Systems (VV-1, CV-1 and Systems (VV-2, CV-2 and/or PV-1/2), as appropriate. Specifically, char iodine samples for the ventilation release path(s) that show a factor of 3 monitor. ^(31.16) ( ^{3.1.18)}	nge out the co	ontinuous particulate,

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	ATTACHMENT K Page 5 of 5 ODCM CONTROLS: GASEOUS EFFLUENT DO	OSE RATI	3
(e)	Tritium grab samples shall be taken at least once per 7 days (from the ap the spent fuel pool area) whenever spent fuel is in the spent fuel pool.	propriate ve	ntilation release path of
	<u>Applicability:</u> Unit 1 Ventilation System (CV-1), or Unit 2 Ventilation 5 Fuel Handling Building atmosphere. In lieu of sampling the ventilation of from the Fuel Handling Building atmosphere. ^(31,11) (31,19)	•	-
(f)	The average ratio of the sample flow rate to the sampled stream flow rate covered by each dose or dose rate calculation made in accordance with 0 3.11.2.2, and 3.11.2.3.		
	<b><u>Clarification</u></b> : The average ratio of the sample flow rate to the sampled so but it must not be used in dose and dose rate calculation. Specifically, us conservative dose calculations, and would compromise licensee response 30-05. For information, a comprehensive three-year Radiation Monitor I response to the unresolved item's concern that the effluent monitors were per ANSI N13.1. The results of that study concluded that a correction fa applied to particulate sample volume calculations and subsequent dose as Specifically, the minimum CF of 2 must be utilized in-lieu of actual ratio stream flow rate. In summary, the minimum CF of 2 provides adequate of particulate sample collection. ^(3.2.13)	se of this rat e to NRC Ur Particle Stud e not collect actor (minim nd dose rate os of sample	io would provide non- iresolved Item 50-334/83- y was performed in ing representative samples um CF of 2) must be calculations. flow rate to the sampled
	Applicability: Unit 1 Ventilation Systems (VV-1, CV-1 & PV-1/2), and CV-2).	Unit 2 Vent	ilation Systems (VV-2 &
(g)	The principal gamma emitters for which the LLD specification will apply radionuclides: Kr-87, Kr-88, Xe-133, Xe-133m, Xe-135, and Xe-138 for 59, Co-58, Co-60, Zn-65, Mo-99, Cs-134, Cs-137, Ce-141, and Ce-144 f does not mean that only these nuclides are to be detected and reported. C identifiable, together with the above nuclides, shall also be identified and the LLD for the analyses should not be reported as being present at the L unusual circumstances result in LLD's higher than required, the reasons s Radioactive Effluent Release Report.	r gaseous en for particulat Other peaks I reported. N LD level for	nissions and Mn-54, Fe- e emissions. This list which are measurable and Nuclides which are below that nuclide. When
(h)	Only when this release path is in use.		
<b>.</b>	Applicability: Unit 1 and Unit 2 Ventilation Systems (VV-1, CV-1, PV CB-2).	V-1/2, VV-2	, CV-2, DV-2, WV-2 &
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Beaver Valley Power Station	Procedure N	lumber: 1/2-ODC-3.03
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ODCM: Controls for RETS and REMP Programs	Revision:	Page Number:
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ODCM CONTROLS: DOSE- NO	OBLE GASES	
CONTROLS: DOSE-NOBLE GASES		
3.11.2.2 In accordance with BV-1 and BV-2 Technical dose from the reactor unit in unrestricted areas noble gases released in gaseous effluents shall	s (see 1/2-ODC-2.0)	2 Figure 5-1) due to
a. During any calendar quarter, to $\leq 5$ mrad beta radiation.	l for gamma radiatio	on and $\leq 10$ mrad for
b. During any calendar year, to $\leq 10$ mrad fradiation.	for gamma radiation	and $\leq 20$ mrad for be
Applicability: At all times.		
Action:		
<ul> <li>a. With the calculated air dose from radioactive noble gase above limits, prepare and submit to the Commission wi 20.2203(a)(2)(v) and 10 CFR 50.4(b)(1), a Special Representation of the limit(s) and defines the corrective actions proposed corrective actions to be taken to assure the sublimits.</li> </ul>	th in 30 days, pursu ort which identifies s taken to reduce the	ant to 10 CFR the cause(s) for e releases and the
b. The provisions of ODCM CONTROL 3.0.3 are not app	licable.	
SURVEILLANCE REQUIREMENTS		
		•
4.11.2.2.1 <u>Dose Calculations</u> . Cumulative dose contribu- with 1/2-ODC-2.02 at least once every 31 days		nined in accordance
		· -
	,	

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	ATTACHMENT M Page 1 of 1 ODCM CONTROLS: DOSE - RADIOIODINES A	ND PARTICU	LATES
CONTROL	S: DOSE-RADIOIODINES, RADIOACTIVE MATE AND RADIONUCLIDES OTHER THAN NOBLE		TICULATE FORM,
3.11.2.3	In accordance with BV-1 and BV-2 Technical Spec dose to MEMBER(S) OF THE PUBLIC from radio particular form (excluding C-14), and radionuclides lives greater than eight days in gaseous effluents rel ODC-2.02 Figure 5-1) shall be limited to the follow a. During any calendar quarter to $\leq 7.5$ mrem t	iodines and rad (other than no eases from the ring:	dioactive materials in oble gases) with half- reactor unit (see 1/2-
	b. During any calendar year to $\leq 15$ mrem to an		iid
Applicabilit	<u>y</u> : At all times.		
Action:			
form eigh Com Spec actic	In the calculated dose from the release of radioiodines, r in, (excluding C-14), and radionuclides (other than noble t days, in gaseous effluents exceeding any of the above mission within 30 days, pursuant to 10 CFR 20.2203(a cial Report, which identifies the cause(s) for exceeding ons taken to reduce the releases and the proposed correc- equent releases will be within the above limits.	e gases) with h limits, prepare a)(2)(v) and 10 the limit and c	alf-lives greater than e and submit to the CFR 50.4(b)(1), a lefines the corrective
b. The	provisions of ODCM CONTROL 3.0.3 are not applica	ble.	-
SURVEILL	ANCE REQUIREMENTS		•
4.11.2.3.1	Dose Calculations. Cumulative dose contributions with 1/2-ODC-2.02 at least once every 31 days.	shall be detern	nined in accordance
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	ODCM CONTROLS: GASEOUS RADWASTE TH	REATMENT S	YSTEM
CONTRO	LS: GASEOUS RADWASTE TREATMENT SYSTEM	M ,	
3.11.2.4	In accordance with BV-1 and BV-2 Technical Spec	cification 6.8.6	a, Item 6, the Gaseous
	Radwaste Treatment System and the Ventilation E	xhaust Treatme	nt System shall be us
	to reduce radioactive materials in gaseous waste pr		
	projected gaseous effluent air doses due to gaseous $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$ $(220)$		
	(see 1/2-ODC-2.02 Figure 5-1), when averaged over gamma radiation and 0.4 mrad for beta radiation.	• ·	
	Ventilation Exhaust Treatment System shall be use		-
	gaseous waste prior to their discharge when the pro-	ojected doses di	le to gaseous effluent
	releases from the reactor unit (see 1/2-ODC-2.02 F	igure 5-1) whe	n averaged over 31 da
	would exceed 0.3 mrem to any organ.		
Applicabil	ty: At all times.		
Action:			·.
a. Wi	h gaseous waste being discharged without treatment ar	nd in excess of	the above limits.
	pare and submit to the Commission within 30 days, put		
10	CFR 50.4(b)(1), a Special Report which includes the fo	ollowing inform	ation.
1.	Identification of the inoperable equipment or subsy	stems and the	reason for inoperabili
	Action(s) taken to restore the inoperable equipmen	t to operational	status, and
2.			·
2. 3.	Summary description of action(s) taken to prevent	a recurrence.	-
3.	Summary description of action(s) taken to prevent provisions of ODCM CONTROL 3.0.3 are not application		-
3. b. The	provisions of ODCM CONTROL 3.0.3 are not application		-
3. b. The			-
3. b. The	provisions of ODCM CONTROL 3.0.3 are not application		-
3. b. The	provisions of ODCM CONTROL 3.0.3 are not applicate ANCE REQUIREMENTS Doses due to gaseous releases from the site shall be	able.	-
3. b. The SURVEIL	provisions of ODCM CONTROL 3.0.3 are not applicate application of ADCM CONTROL 3.0.4 are not applicate application of ADM CONTROL 3.0.4 are not applicate applicate application of ADM CONTROL 3.0.4 are not applicate applicate application of ADM CONTROL 3.0.4 are not applicate ap	able.	-
3. b. The SURVEIL	provisions of ODCM CONTROL 3.0.3 are not applicate ANCE REQUIREMENTS Doses due to gaseous releases from the site shall be	able.	-
3. b. The SURVEIL	provisions of ODCM CONTROL 3.0.3 are not applicate ANCE REQUIREMENTS Doses due to gaseous releases from the site shall be	able.	-
3. b. The SURVEIL	provisions of ODCM CONTROL 3.0.3 are not applicate ANCE REQUIREMENTS Doses due to gaseous releases from the site shall be	able.	-
3. b. The SURVEIL	e provisions of ODCM CONTROL 3.0.3 are not applicate LANCE REQUIREMENTS Doses due to gaseous releases from the site shall be accordance with 1/2-ODC-2.02.	able.	-

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	Page 1 of 1 ODCM CONTROLS: GAS STORAGE	TANKS	÷
CONTRO	LS: GAS STORAGE TANKS	د	• . •
3.11.2.5	In accordance with BV-1 and BV-2 Technical Specif radioactivity contained in the following gas storage ta gas values listed below (considered as Xe-133).		
	a. ≤52,000 Curies: Each BV-1 Waste Gas Decay 7 or 1GW-TK-1C)	Fank (1GW-1	K-1A, or 1GW-TK-1
	b. ≤19,000 Curies: Any connected group of BV-2 (2GWS-TK25A thru 2GWS-TK25G)	Gaseous Was	ste Storage Tanks
APPLICA	BILITY: At all times.		
ACTION:			
<b>a.</b>	With the quantity of radioactive material in any gas sto immediately suspend all additions of radioactive mater reduce the tank contents to within the limit, and	-	•
b.	Submit a Special Report in accordance with 10 CFR 50 a schedule and a description of activities planned and/o within the specified limits.		
С,	The provisions of ODCM Control 3.0.3 are not applica	ble.	
SURVEIL	LANCE REQUIREMENTS		-
4.11.2.5.1	For BV-1 Waste Gas Decay Tanks: The quantity of r		
	each BV-1 Waste Gas Decay Tank shall be determine least once per 24 hours when radioactive materials are Performance of this surveillance is required when the coolant is greater than 100 uCi/ml.	e being added	l to the tank.
	For BV-2 Gaseous Waste Storage Tanks: The quantic contained in any connected group of BV-2 Gaseous V determined to be within the above limit at least once protection are being added to the tanks.	Vaste Storage	Tanks shall be

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	E	Beaver Valley Power Station	Procedure Number: 1/2-ODC-3.03	
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		Page 1 of 1 ODCM CONTROLS: TOTAL DOSE	3	
1 27	CONTROLS:	TOTAL DOSE		·····
	3.11.4.1	In accordance with BV-1 and BV-2 Technical Specifica (calendar year) dose or dose commitment to any MEMI releases of radioactivity and to radiation from uranium to $\leq 25$ mrems to the whole body or any organ, except to to $\leq 75$ mrems.	BER OF TH fuel cycle s	IE PUBLIC due to ources shall be limited
	Applicability:	At all times.		
	Action:			
	exceedin 3.11.2.3a units (ind CONTR Commis Special I prevent r conform include a from ura calendar radiation or conce resulting include a of the rep	calculated doses from the release of radioactive material g twice the limits of ODCM CONTROL 3.11.1.2a, 3.11 a, or 3.11.2.3b, calculations shall be made including direc cluding outside storage tanks, etc.) to determine whether OL 3.11.4.1 have been exceeded. If such is the case, pro- sion within 30 days, pursuant to 10 CFR 20.2203(a)(2)( Report that defines the corrective action to be taken to re- recurrence of exceeding the above limits and includes the ance with the above limits. This Special Report, as defi- in analysis that estimates the radiation exposure (dose) to nium fuel cycle sources, including all effluent pathways year that includes the release(s) covered by this report. and concentrations of radioactive material involved, an intrations. If the estimated dose(s) exceeds the above lim- in violation of 40 CFR Part 190 has not already been co- a request for a variance in accordance with the provision port is considered a timely request, and a variance is gra- s complete.	1.2b, 3.11. ect radiation the above lepare and su v) and 10 C educe subsect e schedule f ned in 10 C o a MEMB and direct It shall also d the cause nits, and if t prrected, the s of 40 CFF	2.2a, 3.11.2.2b, contributions from the limits of ODCM abmit to the FR 50.4(b)(1), a quent releases to for achieving FR 20.405(c), shall ER OF THE PUBLIC radiation, for the describe levels of of the exposure levels he release condition Special Report shall R Part 190. Submittal
· ·	b. The pr	ovisions of ODCM CONTROL 3.0.3 are not applicable.		
	SURVEILLA	NCE REQUIREMENTS		• • • • •
	4.11.4.1.1	Cumulative dose contributions from liquid and gaseous accordance with ODCM SURVEILLANCE REQUIRE and 4.11.2.3.1.		
	4.11.4.1.2	Cumulative dose contributions from direct radiation from storage tanks, etc.) shall be determined in accordance we requirement is applicable only under conditions set for CONTROL 3.11.4.1.	vith 1/2-OD	C-2.04. This

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<u>CONT</u>	ROLS: RADIOLOGICAL ENVIRONMENTAL MONITORI	NG PROGR	AM
enviro 3.12-1	In accordance with BV-1 and BV-2 Technical Specification 6 nmental monitoring program shall be conducted as specified ir ability: At all times.	ODCM Co	
Action		a tagita di ka	
a.	With the radiological environmental monitoring program not ODCM Control 3.12.1, Table 3.12-1, prepare and submit to the Radiological Environmental Report, a description of the reason as required and the plans for preventing a recurrence. Deviate required sampling schedule if specimens are unobtainable due unavailability, malfunction of automatic sampling equipment specimens are unobtainable due to sampling equipment malfut to complete corrective action prior to the end of the next samp	he Commiss ons for not co ions are perfected to hazardou and other le unction, ever	ion, in the Annual onducting the program mitted from the us conditions, seasonal gitimate reasons. If y effort shall be made
b.	With the level of radioactivity in an environmental sampling		
	locations specified in ODCM Control 3.12.1, Table 3.12.1 ex Control 3.12.1, Table 3.12-2 when averaged over any calendar Commission within 30 days from the end of affected calendar to 10 CFR 20.2203(a)(2)(v) and 10 CFR 50.4(b)(1) which inc conditions, environmental factors or other aspects which caus 3.12.1, Table 3.12-2 to be exceeded. This report is not require radioactive was not the result of plant effluents; however, in s reported and described in the Annual Radiological Environment	r quarter, pro quarter a Sp ludes an eva ed the limits ed if the mea uch an even	epare and submit to the becial Report pursuant iluation of any release of ODCM Control asured level of t, the condition shall b
	When more than one of the radionuclides in ODCM Control 3 the sampling medium, this report shall be submitted if:	3.12.1, Table	3.12-2 are detected in
	Concentration (1)Concentration (2)Limit Level (1)+Limit Level (2)+	0	
<b>c</b> .	With milk or fresh leafy vegetable samples unavailable from t selected in accordance with ODCM CONTROL 3.12.2 and lis replacement samples. The locations from which samples wer from those required by ODCM Control 3.12.1, Table 3.12-1 a locations from which the replacement samples were obtained monitoring program as replacement locations, if available.	sted in the O e unavailabl nd the ODC	DCM, obtain e may then be deleted M provided the
<b>d.</b> :	The provisions of ODCM CONTROL 3.0.3 are not applicable	e.	•
<u>SURV</u>	EILLANCE REQUIREMENTS	× 1	···
4.12.1.	1 The radiological environmental monitoring samples sh Control 3.12.1, Table 3.12-1 from the locations given pursuant to be requirements of ODCM Control 3.12.1,	in the ODCI	A and shall be analyze
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MDEOU	REMENTS	, 1		
	NEWILIN I S	\$		
			•	
IONITORI	NG PROG	KAM		
AND ' ''	TVDE AND	ERECHENCV ^(a)		

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ODCM: Controls for RETS and REMP Programs

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# ODCM CONTROLS: REMP-PROGRAM REQUIREMENTS

### TABLE 3.12-1

### RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

EXPOSURE PATHWAY AND/OR SAMPLE	NUMBER OF SAMPLES AND LOCATIONS	SAMPLING AND COLLECTION FREQUENCY	TYPE AND FREQUENCY ^(a) OF ANALYSIS
1. AIRBORNE a. Radioiodine And Particulates	<ul> <li>5 locations</li> <li>"□9□□ TC \1 4</li> <li>1. One sample from a control location 10-20 miles distant and in the least prevalent wind direction</li> <li>2. One sample from vicinity of community having the highest calculated annual average ground level D/Q.</li> </ul>	Continuous operation of sampler with sample collection at least weekly.	Each radioiodine canister. Analyze for I-131; Particulate sampler. Analyze for gross beta weekly ^(b) ; Perform gamma isotopic analysis on composite (by location) sample at least quarterly.
2. DIRECT RADIATION	40 locations ≥ 2 TLDs or a pres- surized ion chamber at each location.	Continuous measurement with collection at least quarterly.	Gamma dose, quarterly.

^(a)Analysis frequency same as sampling frequency unless otherwise specified.

(b) Particulate samples are not counted for ≥ 24 hours after filter change. Perform gamma isotopic analysis on each sample when gross beta is >10 times the yearly mean of control samples.

**Sample locations are given on figures and tables in 1/2-ODC-2.03.

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	TABLE	E 3.12-1 (continued)				
RADI	OLOGICAL ENVIRO	NMENTAL MONITOR	UNG PROC	RAM		
EXPOSURE	NUMBER OF	CAMPLINIC AND	TYDE AND	EDEOLIENCV ^(a)		
PATHWAY AND/OR		SAMPLING AND COLLECTION	OF ANALY	D FREQUENCY ^(a)		
SAMPLE	LOCATIONS**	FREQUENCY	OF ANAL			
	LOCATIONS	FREQUENC I				
3. WATERBORNE						
a. Surface	1 One cample	Composite* sample	Gamma isotopic analysis of			
		collected over a period	composite sample by location			
	upstream.	not to exceed 1 month.	monthly;			
	2. One sample		Tritium analysis of			
	downstream.		composite sample at least			
			quarterly.	-		
b. Drinking	2 locations.	Composite* sample	I-131 analys	sis of each		
		collected over a period	composite s	1		
		not to exceed 2 weeks.	-			
		· ·	Gamma iso	topic analysis of		
			composite s	ample (by		
			location) m	onthly;		
	· ·			lysis of composite		
			sample qua	rterly.		
c. Groundwater	N/A - No wells in low	er elevations between		·		
o. Groundwaler	plant and river			-		
d. Sediment From	1 location.	Semi-annually.	Gamma isot	topic analysis		
Shoreline			semi-annua			
		1		-		

^(a)Analysis frequency same as sampling frequency unless otherwise specified.

*Composite samples shall be collected by collecting an aliquot at intervals not exceeding two hours. For the upstream surface water location, a weekly grab sample, composited each month based on river flow at time of sampling, is also acceptable.

**Sample locations are given on figures and tables in 1/2-ODC-2.03.

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00		MP-PROGRAM REQU	IID EN AENITS	1	
OD OD	CIVI CONTROLS. KEI		INCLIVILIN I S	)	
	TABLE	3.12-1 (continued)			
RADI	OLOGICAL ENVIRO	MENTAL MONITOR	ING PROG	RAM	
EXPOSURE	NUMBER OF	SAMPLING AND	TVDE AND	FREQUENCY ^(a)	
PATHWAY AND/OR	-	COLLECTION	OF ANALY		
SAMPLE	LOCATIONS**	FREQUENCY	OI AINALI	515	
4. INGESTION					
a. Milk	4 locations. ^(b)	Atleast bi-weekly when	Gamma isoto	opic and I-131	
		animals are on pasture;	analysis of e		
	1. Three samples	at least monthly at		-	
	selected on basis of	other times.			
	highest potential				
	thyroid dose using				
	milch census data.				
	2. One local large				
	dairy.				
b. Fish	2 locations.	Semi-annual. One	Gamma isoto	opic analysis on	
		sample of available	edible portio	ons.	
		species.			
c. Food Products	4 locations.	Annually at time of		opic analysis and	
(Leafy		harvest.	I-131 analys	is on edible	
Vegetables)	1. Three locations within 5 miles.		portion.		
	2. One control				
	location.				
	#14.	· · · · · ·	· · · · · · · · · · · · · · · · · · ·	-	

^(a)Analysis frequency same as sampling frequency unless otherwise specified.

^(b)Other dairies may be included as control station or for historical continuity. These would not be modified on basis of milch animal census.

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**Sample locations are given on figures and tables in 1/2-ODC-2.03.

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## ODCM CONTROLS: REMP-PROGRAM REQUIREMENTS

# TABLE 3.12-2

#### **REPORTING LEVELS FOR RADIOACTIVITY CONCENTRATIONS**

· · · · · · · · · · · · · · · · · · ·	· <u>·</u> ···				
	р. Д		EPORTING LEVE		
		AIRBORNE	Diari		BROAD LEAF
	WATER	PARTICULATE OR	FISH	MILK	VEGETABLES
ANALYSIS	(pCi/l)	GASES (pCi/m ³ )	(pCi/kg, WET)	(pCi/l	(pCi/kg, WET)
H-3	2E+4 ^(a)				
Mn-54	1E+3		3E+4		
Fe-59	4E+2		1E+4		
Co-58	1E+3		3E+4		
Co-60	3E+2	•	1E+4		
Zn-65	3E+2		: 2E+4		
Zr/Nb-95	4E+2				
I-131	2 ^(b)	0.9		3	1E+2
Cs-134	30	10	1E+3	60	1E+3
Cs-137	50	20	2E+3	70	2E+3
Ba/La-140	2E+2			3E+2	-

IN ENVIRONMENTAL SAMPLES

(a) For drinking water samples. This is a 40 CFR Part 141 value. If no drinking water pathway exists, a value of 3E+4 pCi/l may be used.

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^(b) If no drinking water pathway exists, a value of 20 pCi/l may be used.

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le:				•		Unit:	Level Of Use:		
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		ODCM	CONTROLS.	Page 6 of 8 REMP-PROGI	2 AM RE				
		ODÇM		•		QUILLINEITI			
			• •	<u>TABLE 4.12</u>	<u>-1</u>				
	MAXI	MUM VA	ALUES FOR T	HE LOWER LI	MITS OF	DETECTION (	(LLD) ^{(a)(c)}		
		· · · · · · · · · · · · · · · · · · ·	AIRBORNE				·		
	an a	WATER	PARTICULATE OR GAS			FOOD			
	ANALYSIS	(pCi/l)	$(pCi/m^3)$	FISH (pCi/kg, WET)	MILK (pCi/l)	PRODUCTS (pCi/kg, WET)	SEDIMENT (pCi/kg, DRY)		
	Gross Beta	4	1E-2		(peb)				
	Oloss Dela		112-2		· -		·		
	H-3	2000 ^(d)							
	Mn-54	15		130					
	Fe-59	30		260					
	Co-58,60	15		130	1				
	Zn-65	30		260					
	Zr-95	30 ^(c)							
	Nb-95	15 ^(c)							
	I-131	1 ^(b)	7E-2		1	60			
	Cs-134	15	5E-2	130	15	60	150		
	Cs-137	18	6E-2	150	18	80	180		
	Ba-140	60 ^(c)	÷		60				
	La-140	15 ^(c)			15	ç			

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Title:

(a)

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### TABLE 4.12-1 (continued)

### TABLE NOTATION

The LLD is the smallest concentration of radioactive material in a sample that will be detected with 95% probability with 5% probability of falsely concluding that a blank observation represents a "real" signal.

For a particular measurement system (which may include radiochemical separation):

LLD =  $\frac{4.66 \text{ Sb}}{(E)(V)(2.22)(Y) \exp(-\lambda\Delta T)}$ 

where:

LLD is the lower limit of detection as defined above (as pCi per unit mass or volume);

 $S_b$  is the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate (as counts per minute);

E is the counting efficiency (as counts per transformation);

V is the sample size (in units of mass or volume);

2.22 is the number of transformations per minute per picocurie;

Y is the fractional radiochemical yield (when applicable);

 $\lambda$  is the radioactive decay constant for the particular radionuclide;

 $\Delta T$  is the elapsed time between sample collection (or end of the sample collection period) and time of counting (for environmental samples, not plant effluent samples).

The value of  $S_b$  used in the calculation of the LLD for a detection system shall be based on the actual observed variance of the background counting rate or of the counting rate of the blank samples (as appropriate) rather than on an unverified theoretically predicted variance. In calculating the LLD for a radionuclide determined by gamma-ray spectrometry, the background shall include the typical contributions of other radionuclides normally present in the samples (e.g., potassium-40 in milk samples). Typical values of E, V, Y and  $\Delta T$  should be used in the calculations.

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### ATTACHMENT Q Page 8 of 8 ODCM CONTROLS: REMP-PROGRAM REQUIREMENTS

### TABLE 4.12-1 (continued)

## TABLE NOTATION

The LLD is defined as an <u>a priori</u> (before the fact) limit representing the capability of a measurement system and not as <u>a posteriori</u> (after the fact) limit for a particular measurement. Analyses shall be performed in such a manner that the stated LLD's will be achieved under routine conditions. Occasionally, background fluctuations, unavoidable small sample sizes, the presence of interfering nuclides, or other uncontrollable circumstances may render these LLD's unachievable. In such cases, the contributing factors shall be identified and described in the Annual Radiological Environmental Report.

^(b) If no drinking water pathway exists, a value of 15 pCi/l may be used.

^(c) If parent and daughter are totaled, the most restrictive LLD should be applied.

^(d) If no drinking water pathway exists, a value of 3000 pCi/l may be used.

^(e) This list does not mean that only these nuclides are to be detected and reported. Other peaks which are measurable and identifiable, together with the above nuclides, shall be identified in the Annual Radiological Environmental Report.

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ODCM CONTROLS: REMP - LAND US	SE CENSUS		
CONTROLS: RADIOLOGICAL ENVIRONMENTAL MONITO	RING - LAND	USE CENSUS	
3.12.2 In accordance with BV-1 and BV-2 Technical Spec census shall be conducted and shall identify the loc nearest residence, and the nearest garden of greater leaf vegetation in each of the 16 meteorological sec For elevated releases as defined in Regulatory Guid use census shall also identify the locations of all mi than 500 square feet producing fresh leafy vegetable sectors within a distance of three miles.	ation of the ne than 500 squa tors within a d le 1.111, (Rev. lk animals and	arest milk animal, the re feet producing broad istance of five miles. 1), July, 1977, the land all gardens of greater	
Applicability: At all times.	÷		
Action:			
a. With a land use census identifying a location(s) which yields commitment greater than the values currently being calculate REQUIREMENT 4.11.2.3.1, prepare and submit to the Com CFR 20.2203(a)(2)(v) and 10 CFR 50.4(b)(1), a Special Rep- location(s).	ed in ODCM S mission within	URVEILLANCE (130 days, pursuant to 10)	
b. With a land use census identifying a milk animal location(s) commitment (via the same exposure pathway) 20% greater thare currently being obtained in accordance with ODCM CON the Commission within 30 days, pursuant to 10 CFR 20.2203 Special Report, which identifies the new location. The new l radiological environmental monitoring program within 30 day program shall include samples from the three active milk ani calculated dose or dose commitment. Any replaced location program after October 31 of the year in which this land use c	han at a locatio NTROL 3.12.1 B(a)(2)(v) and location shall b location shall b mal locations, may be deleted	n from which samples prepare and submit to 10 CFR 50.4(b)(1), a be added to the The milk sampling having the highest d from this monitoring	
c. The provisions of ODCM CONTROL 3.0.3 are not applicabl	le.		
SURVEILLANCE REQUIREMENTS			
	e ner 12 month	s between the dates of	
4.12.2.1 The land use census shall be conducted at least once June 1 and October 1 using that information which by a door-to-door survey*, aerial survey, or by cons	will provide th	e best results, such as	

* Confirmation by telephone is equivalent to door-to-door.

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OD	ATTACHMENT S Page 1 of 1 DCM CONTROLS: REMP - INTERLABORATORY	Y COMPARISO	N PROGRAM
CONTROL	LS: RADIOLOGICAL ENVIRONMENTAL MONIT COMPARISON PROGRAM	FORING - INTE	RLABORATOR
3.12.3	In accordance with BV-1 and BV-2 Technical Sp be performed on radioactive materials supplied a Program.		
Applicabili	t <b>y:</b>		
At all times	S.		• •
Action			
a recub. The p	analyses not being performed as required above, repo irrence to the Commission in the Annual Radiologica provisions of ODCM CONTROL 3.0.3 are not applic LANCE REOUIREMENTS	al Environmenta	
<ul><li>a. With a recu</li><li>b. The p</li></ul>	urrence to the Commission in the Annual Radiologica	al Environmenta able. above required Ir	l Report.
a. With a recub. The p	The results of analyses performed as part of the Annual Radiological are not application of the analyses performed as part of the analyses performed as part of the Annual Radiological and the Annual	al Environmenta able. above required Ir	l Report.
a. With a recub. The p	The results of analyses performed as part of the Annual Radiological are not application of the analyses performed as part of the analyses performed as part of the Annual Radiological and the Annual	al Environmenta able. above required Ir	l Report.
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	ATTACHMENT T Page 1 of 2 ODCM CONTROLS: ANNUAL REMP RE	· <b>*</b>	
CONTROLS:	ANNUAL REMP REPORT		
ANNUAL RA	DIOLOGICAL ENVIRONMENTAL OPERATING RE	PORT ⁽³⁾	
5.9.2 old TS 6.9.1.10)	The Annual Radiological Environmental Operating Rep unit during the previous calendar year shall be submitted The report shall include summaries, interpretations, and of the Radiological Environmental Monitoring Program material provided shall be consistent with the objectives Calculation Manual (ODCM) and in 10 CFR Part 50 Ap and IV.C.	d before N analyses of for the re s outlined	Tay 15 of each year. of trends of the results porting period. The in the Offsite Dose
	The annual radiological environmental reports shall incl	ude:	
<b>* 2</b> - 2%	• Summaries, interpretations, and statistical evaluation environmental surveillance activities for the report p with pre-operational studies, operational controls (as environmental surveillance reports, and an assessme plant operation on the environment.	eriod, incl appropria	luding a comparison ate), and previous
	• The results of the land use censuses required by OD	CM CON	FROL 3.12.2.
	• If harmful effects or evidence of irreversible damage the report shall provide an analysis of the problem as alleviate the problem.		• •
~ `	• Summarized and tabulated results in the format of O Table 6.9-1 of all radiological environmental sample In the event that some results are not available for in shall be submitted noting and explaining the reasons missing data shall be submitted as soon as possible in	es taken du clusion wi for the m	aring the report period. th the report, the report issing results. The
· · · · ·	• A summary description of the radiological environm	ental mon	itoring program.
	• A map of all sampling locations keyed to a table giv one reactor.	ing distand	ces and directions from
	• The results of licensee participation in the Interlabor required by ODCM CONTROL 3.12.3.	atory Com	nparison Program
-	submittal may be made for a multiple unit site. The submittal non to all units at the station.	should con	nbine those sections that

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ODCM: 0	Controls for RET	S and RE		Revision: 4	Page Number: 77 of 79
		ODCM CO	ATTACHMENT T Page 2 of 2 ONTROLS: ANNUAL REMP	REPORT	
	•		NONROUTINE REPORTED MEASUREMENTS		
х. -	MARY		CONTROL LOCATIONS MEAN(F) [*] RANGE [*]		ted in parenthesis (f).
	GRAM SUM	Reporting Period	AN MEAN(F) ^b RANGE ^b		OL 3.11.1.1. cations is indice
	TABLE E:6.9-1 OGICAL MONITORING PROGRAM SUMMAR' Docket No.	Repor	LOCATIONS WITH HIGHEST ANNUAL MEAN NAME DISTANCE MEAN AND DIRECTION RANGE		Nominal Lower limits of Detection (LLD) as defined in Table Notation ⁴ of Table 4.12-1 of ODCM CONTROL 3.11.1.1. Mean and range based upon detectable measurement only. Fraction of detectable measurement at specified locations is indicated in parenthesis (f)
	TABLF ADIOLOGICAL	(County, State)	ALL INDICATOR LOCATIONS MEAN(P) RANGE ⁶		Notation of Table 4 ection of detectable n
	ENVIRONMENTAL RADIOL		LOWER LIMITS OF CLLD) (LLD)		as defined in Table surement only. Fri surement only.
	ENVIRONMEN Name Of Facility	Location Of Facility	TYPE AND TOTAL NUMBER OF ANALYSES PERFORMED		s of Detection (LLD) d upon detectable mer
			MEDIUM OF PATHWAY SAMPLED (UNIT OF MEASUREMENT)		<ul> <li>Nominal Lower limits of Detection (LLD) as defined in Table Notation</li> <li>Mean and range based upon detectable measurement only. Fraction of of</li> </ul>

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<u></u>	ATTACHMENT U Page 1 of 2 ODCM CONTROLS: ANNUAL RETS R		<u> </u>			
CONTROLS:	ANNUAL RETS REPORT		:			
ANNUAL RA	DIOACTIVE EFFLUENT RELEASE REPORT ⁽⁴⁾		· ·			
6.9.3 (old TS 6.9.1.11)	The Annual Radioactive Effluent Release Report (ARERR) covering the operation of the unit during the previous year shall be submitted prior to May 1 of each year in accordance with 10 CFR 50.36a. The report shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the unit. The material provided shall be consistent with the objectives outlined in the ODCM and Process Control Program (PCP) and in conformance with 10 CFR 50.36a and 10 CFR Part 50, Appendix I Section IV.B.1.					
	This report is prepared and submitted in accordance with 1/2-ENV-01.05, and at a minimum, shall contain the following:					
	• A summary of the quantities of radioactive liquid waste released from the unit as outlined in Regul 1974, "Measuring, Evaluating, And Reporting Ra Releases Of Radioactive Materials In Liquid And Water-Cooled Nuclear Power Plants," with data s following the format of Appendix B thereof.	atory Güide 1 adioactivity Ir I Gaseous Eff	.21, Revision 1, June, Solid Wastes And luents From Light-			
	• An assessment of radiation doses from the radioa released from the unit during each calendar quart 1.21. In addition, the unrestricted area boundary beta air doses shall be evaluated. The assessment performed in accordance with this manual.	er as outlined maximum no	in Regulatory Guide ble gas gamma air and			
	• Any licensee initiated changes to the ODCM made during the 12 month period.					
•	• Any radioactive liquid or gaseous effluent monitor returned to OPERABLE status within 30 days, ar corrected in a timely manner. This applies to the monitoring instrumentation channels required to CONTROLS 3.3.3.9 and 3.3.3.10.	nd why the ind liquid or gase	operability was not eous effluent			
·	• Any ODCM SURVEILLANCE REQUIREMEN monitoring, sampling and analysis and dose proje		. This applies to			
	• The reasons when unusual circumstances result in ODCM CONTROL 3.11.1.1, Table 4.11-1 and O 4.11-2.	•				

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	ODCM CONTROLS: ANNUAL RETS	REPORTS	
CONTROLS: A	NNUAL RETS REPORT (continued)		
	The following information for each time of colid	l	d effectes during the
•	The following information for each type of solid report period:	r waste snippe	a onsite during the
	- container volume		
	- total curie quantity (determined by measureme	nt or estimate)	)
	- principal radionuclides (determined by measur		-
	- type of waste (e.g., spent resin, compacted dry bottoms)	waste, evapor	ator
	- type of container (e.g., LSA, Type A, Type B,	Large Quantit	v)
	- solidification agent (e.g., cement)		· ·
	- classification and other requirements specified	by 10 CFR Pa	art 61
-	An annual summary of hourly meteorological da	ata collected o	ver the previous year
	This annual summary may be either in the form		
	speed, wind direction, atmospheric stability, and		
	magnetic tape, or in the form of joint frequency	distributions c	of wind speed, wind
	direction, and atmospheric stability.		
•	An assessment of the radiation doses due to the	radioactive liq	uid and gaseous
	effluents released from the unit or station during	the previous	calendar year.
•	An assessment of the radiation doses from radio	active effluent	ts to MEMBER(S) O
	THE PUBLIC due to their activities inside the s	ite boundary s	ee 1/2-ODC-2.01
	Figure 5.1 and 1/2-ODC-2.02 Figure 5-1 during		-
	used in making these assessments (e.g., specific shall be included in these reports. The assessme		
	performed in accordance with 1/2-ODC-2.04.	an of faulatiof	1 10353 511811 05
	•		
•	An assessment of radiation doses to the likely m	-	
	reactor releases for the previous calendar year to 190, Environmental Radiation Protection Standa		
*	Acceptable methods for calculating the dose cor		-
	effluents are given in Regulatory Guide 1.109, R		
	(available from Radiation Shielding Information		-
	calculating the dose contribution from direct rad	liation due to 1	N-16.
•	If quantities of radioactive materials released du	ring the report	ting period are
	significantly above design objectives, the report		
			•