

This is a RED Stamp

**ROCKY FLATS PLANT  
EMD OPERATING  
PROCEDURES MANUAL**

**Manual No.: 5-21000-OPS-GW  
Procedure No.: Table of Contents, Rev 7  
Page: 1 of 1  
Effective Date: 10/22/92  
Organization: Environmental Management**

**THIS IS ONE VOLUME OF A SIX VOLUME SET WHICH INCLUDES:**

**VOLUME I: FIELD OPERATIONS (FO)  
VOLUME II: GROUNDWATER (GW)  
VOLUME III: GEOTECHNICAL (GT)  
VOLUME IV: SURFACE WATER (SW)  
VOLUME V: ECOLOGY (EE)  
VOLUME VI: AIR (AP)**

**TABLE OF CONTENTS  
FOR VOLUME II: GROUNDWATER**

<b><u>Procedure No.</u></b>	<b><u>Title</u></b>	<b><u>Rev. No.</u></b>	<b><u>Effective Date</u></b>
GW.01	Water Level Measurements in Wells and Piezometers	2	05/12/92
GW.02	Well Development	2	05/12/92
DCN 92.01	Practice Clarification	2	10/05/92
DCN 92.02	Update Forms to Include Form Number	2	10/22/92
GW.03	Pump-In Borehole Packer Testing	2	05/12/92
GW.04	Slug Testing	2	05/12/92
GW.05	Field Measurement of Groundwater Field Parameters	2	05/12/92
GW.06	Groundwater Sampling	2	05/12/92
DCN 92.01	Form Update	2	10/05/92
DCN 92.02	Update Forms to Include Form Number	2	10/22/92
GW.08	Aquifer Pumping Tests	1	05/12/92
DCN 92.01	Clarify pump testing procedures	1	05/22/92
DCN 92.02	New pumping test data sheets	1	05/15/92

**DOCUMENT CLASSIFICATION REVIEW WAIVER  
PER R.B. HOFFMAN, CLASSIFICATION OFFICE  
JUNE 11, 1991**

**ADMIN RECORD**

**ENVIRONMENTAL MANAGEMENT  
DOCUMENT CHANGE NOTICE (DCN)**

This is a **CONTROLLED DOCUMENT**

Process Number: **ROCKY FLATS (10) OPS-GW.02, Rev. 2**

ENVIRONMENTAL MANAGEMENT

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Title <b>Well Development</b>	Date <b>10/14/92</b>	DCN Number <b>5-21000-OPS-GW.02 92.02</b>
Expires <u>10/14/93</u> Procedure Revision Required <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <span style="float:right"><i>KAM</i></span>		
Scope Limitation: <u>None</u>		

Item Number	Page	Step or Paragraph	Changes (Use DCN CONTINUATION SHEET for additional space)
1	Form GW.2B (2 pg)	N/A	Replace the old form (Rev. 1.3, 6/1/92), entitled "Rocky Flats Plant Ground Water Redevelopment Log" with the new form (Rev. 2) attached.

Justification (Reason for change - Provide numbers to reference corresponding items above.)

- Old form (issued in DCN 92.01) did not include the form number on the form attached to DCN 92.01. This form (Rev. 2) includes the form number and the revision number.

Concurrence	Organization	Req.	Date	Concurrence	Organization	Req.	Date
<i>[Signature]</i>	QAPM	X	10/22/92	<i>[Signature]</i>	User		10/15/92
<i>[Signature]</i>	EOM	X	10-20-92				
Approval of Responsible Manager <i>[Signature]</i>				Date <u>10-20-92</u>	Is Posting required? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If Yes, by what date? date of receipt	
						Date posted _____	

U.S. DEPARTMENT  
OF ENERGY

FORM GW.2B  
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REVISION 2

# ROCKY FLATS PLANT GROUND WATER WELL REDEVELOPMENT LOG

PROJECT NAME: Ground Water Re-Development  
 PROJECT NO.: 304902  
 QC REVIEW BY/DATE: \_\_\_\_\_  
 SOLINST: \_\_\_\_\_

WELL ID.: \_\_\_\_\_  
 TEAM MEMBERS: \_\_\_\_\_  
 SAMPLES COLLECTED BY: \_\_\_\_\_  
 DATE: \_\_\_\_\_

SERIAL NUMBER                      CALIBRATION DATE

**PURGE METHOD - TYPE USED:**  
 BAILER     PNEUMATIC     PERISTALTIC     INERTIA     OTHER \_\_\_\_\_  
 BAILER     TEFLON     STAINLESS     OTHER \_\_\_\_\_

**PURGING REQUIREMENTS & CALCULATIONS - DATUM: TOP OF WELL CASING (TOWC)**  
 ID = WELL CASING INSIDE DIAMETER (INCHES) = \_\_\_\_\_  
 UV = UNIT CASING VOLUME (GAL/LINEAR FOOT) = \_\_\_\_\_  
 WD = DEPTH TO WATER (FEET) = \_\_\_\_\_  
 TD = TOTAL DEPTH (FEET) MEASURED TOTAL DEPTH (MTD) + PROBE END \_\_\_\_\_  
 IC = INITIAL WATER COLUMN (FEET) = TD - WD = \_\_\_\_\_ - \_\_\_\_\_ = \_\_\_\_\_  
 IV = INITIAL WATER VOLUME (GALLONS) = UV x IC = \_\_\_\_\_ x \_\_\_\_\_ = \_\_\_\_\_  
 CHECKED BY: \_\_\_\_\_

PURGED VOLUMES AND RECHARGE								
VOLUME PURGED (GAL)	TEMPERATURE °C	CONDUCTANCE (mc/cm)	pH (SU)	DO (mg/L)	NITRATE (ppm)	TIME (24 HOUR)	TURBIDITY (FTU)	WATER DESCRIPTION (COLOR, TURBIDITY, ODOR, OIL, ETC.)

EQUIPMENT CALIBRATION						
EQUIPMENT TYPE	EQUIPMENT ID NUMBER	STANDARD USED/LOT NUMBER	EQUIPMENT READING	TEMPERATURE (°C)	DATE	TIME

FINAL TOTAL DEPTH FROM MARK ON NORTH SIDE OF INNER CASING					
TEAM MEMBER	READING	TOTAL DEPTH	PROBE END	MEASURED TOTAL DEPTH	AVG. MEAS. TOTAL DEPTH

SIGNATURE: \_\_\_\_\_  
 DATE: \_\_\_\_\_

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ROCKY FLATS PLANT  
GROUND WATER WELL REDEVELOPMENT LOG  
(Continued)  
COMMENTS

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VOLUME 1

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VOLUME 2

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VOLUME 3

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VOLUME 4

**ENVIRONMENTAL MANAGEMENT  
DOCUMENT CHANGE NOTICE (DCN)**

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Rocky Flats Plant Groundwater Sampling - Rev. 2

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ENVIRONMENTAL MANAGEMENT

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Title Groundwater Sampling	Date 10/14/92	DCN Number 5-21000-OPS- GW.06 92.02
Expires 10/14/93	Procedure Revision Required	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <i>DM</i>
Scope Limitation: None		

Item Number	Page	Step or Paragraph	Changes (Use DCN CONTINUATION SHEET for additional space)
1	Form GW.6A	N/A	Replace old form (no form #; dated 5/20/92), entitled "Field Activity Daily Log", with the new one attached (Rev. 3, dated 5/20/92).
2	Form GW.6B (2 pg)	N/A	Replace old form (Rev. 1.4, dated 5/13/92), entitled "Rocky Flats Plant Ground Water Sample Collection Log", with the new one attached (Rev. 2, dated 5/13/92).
3	Form GW.6C	N/A	Replace old form (Rev. 1.4, dated 5/20/92), entitled "Well Status Form", with the new one attached (Rev. 2, dated 5/20/92).

Justification (Reason for change - Provide numbers to reference corresponding items above.)

1, 2, 3: Forms issued in DCN 92.01 did not include form numbers and revision numbers.

Concurrence	Organization	Req.	Date	Concurrence	Organization	Req.	Date
<i>[Signature]</i>	QAPM	X	10/20/92	<i>[Signature]</i>	User		10/15/92
<i>[Signature]</i>	EOM	X	10-20-92				
Approval of Responsible Manager			Date	Is Posting required?	If Yes, by what date?	Date posted	
<i>[Signature]</i>			10-20-92	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	upon receipt		



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Form GW.6B  
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REVISION 2

# ROCKY FLATS PLANT GROUND WATER SAMPLE COLLECTION LOG

PROJECT NAME: Quarterly Ground Water Sampling SAMPLE NO.: GW \_\_\_\_\_ IT  
 PROJECT NO.: 304902 WELL I.D.: \_\_\_\_\_  
 COC/RFA NO.: \_\_\_\_\_ SAMPLES COLLECTED BY: \_\_\_\_\_  
 COC/RFA NO.: \_\_\_\_\_ ZONE: \_\_\_\_\_  
 COC/RFA NO.: \_\_\_\_\_ DATES COLLECTED: \_\_\_\_\_  
 QC REVIEW BY/DATE: \_\_\_\_\_

PURGE METHOD - TYPE USED:  
 BAILER     TEFLON  
 OTHER \_\_\_\_\_

CASING SIZE (INCHES) (A)	1	2	3	4	6
UNIT CASING VOLUME (GAL/LIN FT.) (B)	0.04	0.16	0.37	0.65	1.50

**PURGING REQUIREMENTS & CALCULATIONS** - Datum: Top of Casing (TOWC) PURGE DATE: \_\_\_\_\_  
 ID = WELL CASING INSIDE DIAMETER (INCHES) = \_\_\_\_\_  
 UV = UNIT CASING VOLUME (GAL/LINEAR FOOT) = \_\_\_\_\_  
 WD = DEPTH TO WATER (FEET) = \_\_\_\_\_  
 TD = TOTAL DEPTH (FEET) MEASURED TOTAL DEPTH (MTD) + PROBE END \_\_\_\_\_  
 IC = INITIAL WATER COLUMN (FEET) = TD - WD = \_\_\_\_\_  
 IV = INITIAL WATER VOLUME (GALLONS) = UV x IC = \_\_\_\_\_ x \_\_\_\_\_ = \_\_\_\_\_  
 SD = DEPTH TO TOP OF SCREEN = \_\_\_\_\_ - 2FEET = \_\_\_\_\_  
 IS WD LESS THAN SD - 2 FEET? (Y/N) \_\_\_\_\_ IF Y THEN:  
     AC = ADJUSTED WATER (FEET) = TD - SD = \_\_\_\_\_ - \_\_\_\_\_ = \_\_\_\_\_  
     AV = ADJUSTED CASING VOLUME (GAL) = UV x AC = \_\_\_\_\_ x \_\_\_\_\_ = \_\_\_\_\_  
 THEN 2 x AV = 2 x \_\_\_\_\_ = \_\_\_\_\_ (GAL)  
 IF N. THEN 3 x IV = 3 x \_\_\_\_\_ = \_\_\_\_\_ (GAL) CHECKED BY: \_\_\_\_\_

PURGED VOLUMES AND RECHARGE								WATER DESCRIPTION (COLOR, TURBIDITY, ODOR, OIL, ETC..)
VOLUME PURGED (GAL)	TEMP °C	CONDUCTANCE (ms/cm)	pH (Su)	DO (mg/L)	NITRATE (ppm)	TIME (24 HOUR)	TURBIDITY (FTU)	

**PURGE VOLUMES & RECHARGE**  
 ACTUAL PURGED VOLUME (GALLONS) = \_\_\_\_\_ PURGED DRY? (Y/N) = \_\_\_\_\_  
 90% OF IC = 0.9 x IC (OR AC) = 0.9 x \_\_\_\_\_ = \_\_\_\_\_  
 10 MINUTE WATER LEVEL RECOVERY: TIME START \_\_\_\_\_ TIME STOP \_\_\_\_\_  
 ER = ESTIMATED 30 MINUTE RECHARGE = (TD - 10 MINUTE WD) x 3 = ( \_\_\_\_\_ - \_\_\_\_\_ ) x 3 = \_\_\_\_\_  
 DEPTH TO WATER PRIOR TO SAMPLING \_\_\_\_\_ VOLUME \_\_\_\_\_ TIME \_\_\_\_\_ DATE \_\_\_\_\_  
 DEPTH TO WATER PRIOR TO SAMPLING \_\_\_\_\_ VOLUME \_\_\_\_\_ TIME \_\_\_\_\_ DATE \_\_\_\_\_  
 2nd 10 MIN. RECHARGE: ER = ( \_\_\_\_\_ - \_\_\_\_\_ ) x 3 = \_\_\_\_\_  
 3rd 10 MIN. RECHARGE: ER = ( \_\_\_\_\_ - \_\_\_\_\_ ) x 3 = \_\_\_\_\_ CHECKED BY: \_\_\_\_\_

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Form GW.6B  
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REVISION 2

# ROCKY FLATS PLANT GROUND WATER SAMPLE COLLECTION LOG CONTINUED

PROJECT NAME: Quarterly Ground Water Sampling SAMPLE NO.: GW IT  
PROJECT NUMBER: 304902. WELL I.D.: \_\_\_\_\_

EQUIPMENT TYPE	EQUIPMENT ID#	STANDARD USED LOT NUMBER	EQUIPMENT READING	TEMPERATURE (°C)	DATE	TIME

<p><b>SAMPLE METHOD - TYPE USED:</b></p> <p><input type="checkbox"/> PUMP      <input type="checkbox"/> PERISTALTIC</p> <p><input type="checkbox"/> BAILER      <input type="checkbox"/> TEFLON</p> <p><input type="checkbox"/> OTHER _____</p>	<p><b>PH OFFSCALE</b> _____</p> <p><input type="checkbox"/> YES TOTAL ALKALINITY: _____ x 10 _____ ppm AT _____ pH</p> <p><input type="checkbox"/> NO TOTAL ALKALINITY (FULL RANGE) _____ ppm AT _____ pH</p> <p>NITRITE _____ mg/l - BLANK VALUE _____ mg/l</p> <p>= FINAL NITRITE _____</p> <p>FINAL DO _____ mg/l      CHECKED BY: _____</p>
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TEMP (°C)	pH (SU)	CONDUCTIVITY (mc/cm)	DO (mg/L)	DATE	TIME	TURBIDITY (FTU)	INITIALS

ANALYSIS	PARTIAL	RAD	VOA	RAD. ISO.	INORG.	NITRATE	BNA	PCB	α,β,γ	α,β,γ	DESE. METALS	TOTAL METALS	TOC	COO	AMMONIA	Pu/Am	TRIT
	FULL							PESTICIDE									
VOLUME	100 ml		(2) 40ml	100 ml	1 LITER	250 ml	(2) 1 LITER	(2) 1 LITER	1 LITER	GAL	1 LITER	1 LITER	125 ml	125 ml	1 LITER	GAL	100 ml
PRES.						H <sub>2</sub> SO <sub>4</sub>			HNO <sub>3</sub>	HNO <sub>3</sub>	HNO <sub>3</sub>	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	H <sub>2</sub> SO <sub>4</sub>	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	
									FILTER	FILTER	FILTER						
DATE																	
TIME																	

NO. OF BOTTLES \_\_\_\_\_

ANALYSIS	PARTIAL	Pu/Am		Cu, Zn, Sr	CYANIDE	ORTHOPHOSPHATE	OTHER
	FULL	Pu	Am				
VOLUME		GAL	GAL	GAL	1 LITER	250 ml	
PRES.		HNO <sub>3</sub>	HNO <sub>3</sub>	HNO <sub>3</sub>	NaOH		
				FILTER		FILTER	
DATE							
TIME							

NO. OF BOTTLES \_\_\_\_\_

COMMENTS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

PRINT NAME: \_\_\_\_\_  
 SIGNATURE/DATE: \_\_\_\_\_

