Geologic Characterization Report

Appendix F

Volume II

91-0104

ADMIN RECORD

A-SW-000273

GEOLOGIC CHARACTERIZATION REPORT

For U.S. DOE-Rocky Flats Plant

EG&G ROCKY FLATS

APPENDIX F

(VOL. 2)

July 31, 1991

REVIEWED FOR CLASSIFICATION/UCNI

By

Date 10/16/91

ADMIN RECORD

LOG OF BORING NO. 1-87

GEOLOGIST(S): Nay
DATE: 8/11/89

PROJECT NO: 6667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
00	00 -1.65	ND					CL	1		GRAVELLY SANDY CLAY - MODERATE YELLOWISH BROWN (10 YR 5/4), MOD-POOR PLAST, GREATER SAND CONTENT IN 1ST 3IN, MAX GRAVEL SIZE = 4 cm TRACE IRONSTAINING AS MOTTLES, TRACE CALCITE, SLIGHTLY CALCAREOUS
	1.65 -4.0	Ø						2, 3, 4		NO SAMPLE
BOX 1 OF 1	4.0 -5.6	(1) 1.3					CL CL	5		TOP 6IN - SAME AS ABOVE BOTTOM OF INTERVAL. SILTY CLAY, LIGHT GREY (N7), DARK YELLOWISH ORANGE (10 YR 6/6), GREYISH YELLOW (5 Y 8/4), MOD-HIGH PLAST, SOME SAND, SOME GRAVEL, MAX SIZE GRAVEL = 3 cm, SUBANGULAR - SUBANGULAR GRAVEL & SAND. SOME IRON STAINING AS MOTTLES
	5.6 -5.92	(2)					CL			SAME AS ABOVE, WITH MODERATE BROWN (5 YR 3/4)
	5.92 -7.35	(1) 1.6					CL	6, 7		SAME AS ABOVE, CALCITE AS MOTTLES, SOME CALC. MATERIAL
	7.35-7.5	ND					CL			SAME AS ABOVE
	7.5 -8.7	(1) 0.6					CL	8		FG-MG SANDY CLAY, MODERATE YELLOWISH BROWN (10 YR 5/4), MOD-HIGH PLAST, SOME GRAVEL MAX GRAVEL SIZE = 6 cm
	8.7 -11.75	Ø						9		NO SAMPLE

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 1-87

GEOLOGIST(S): DAS
DATE: 8/11/89

PROJECT NO: 6667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
BOX 1 of 1	8.7 -11.75	Ø						11		NO SAMPLE
	11.75 -12.95	(1) 1.0					CL	12		FG-MG SANDY CLAY, DUSKY YELLOW (5 Y 6/4), MOD PLAST., TRACE GRAVEL
	12.95 -14.87	ND					CL	13 14		SAME AS ABOVE. LESS SAND AT BOTTOM OF INTERVAL
END OF BOXES								15 16 17 18 19		

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH0187

GEOLOGIST(S): DCB
DATE: 9/23/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0 0 ↓	0.0 to 1.3	ND				>50% gravel size	GC	1		Asphaltic concrete, clay and gravel, gravel is dominantly med. light gray (N6) clay matrix is pale yellowish brown (10 YR 6/2) gravel is angular to subangular, poorly sorted, max size 6 cm.
	1.3 to 2.0	0						2		No Sample
	2.0 to 4.0	(1) 1.2				>50% gravel	GC	3		Clayey Gravel, dominantly light gray (N7), clay matrix is light brown (5 YR 6/4), angular, poorly sorted, max size 6 cm., some sand
Box 1 of 2	4.0 to 7.4	(1) 1.75				>50% clay		4, 5, 6, 7		Claystone, very light gray (N7), bedding not apparent, highly weathered slightly friable, occasional iron staining and mg oxide.
	7.4 to 9.4	ND						8, 9		
↑ 9.4	9.4									
9.4 ↓	9.4 to 9.6	ND								
Box 2 of 2	9.6 to 18.4	ND								

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH0187

GEOLOGIST(S):
DATE:

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 2	9.6 to 12.4	ND				Clay >50%		11, 12		Claystone as above
								13		Bottom of Box 2 of 2 at 12.4 ft.

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SPO 187

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DAT
DATE:
CHECKED BY:

USCS symbol

DATE: 8/8/89

PROJECT NO: 667-11.22

Depth Scale	Depth Scale	Sample Type	Recovery (ft)	USCS Symbol	Fracture Freq	Fracture Incl	Blows per 6 in	Blows per 6 in	Graphic Log	LITHOLOGIC DESCRIPTION
00 ↓	0.0-1.0		(1) 0.5	GP						~~TOPSOIL~~ SANDY GRAVEL, MODERATE YELLOWISH BROWN (10 YR 5/4), ANGULAR SUBROUNDED, MOD GRADING, MAX SIZE = 4 cm, SOME SILT, SOME ROOTS SOME ASPALT, SOME CALCAREOUS MATERIAL (GRASS ROOTS)
	1.0-2.0		Ø							NO SAMPLE
	2.0-4.0		(1) 1.5	GC						SANDY GRAVELY CLAY, GREYISH ORANGE (10 YR 7/4), MOD-HIGH PLASTICITY, SOME SILT, MAX GRAVEL SIZE = 4 cm, ~~CARBONACEOUS~~ CALCAREOUS MATERIAL
	4.0-5.0		0.45	GC						SAME AS ABOVE, MODERATE YELLOWISH BROWN (10 YR 5/4), GRAVEL CONTENT INCREASED, LG AMT OF ASPALT, PART OF FENCE POST
	5.0-6.3		0.55	GC						SAME AS ABOVE, MODERATE ~~BROWNISH ORANGE~~ YELLOWISH BROWN (10 YR 5/4), HIGH PLAST ~~NO ASPALT~~ SOME SILT, NO ASPALT OR POST, SLIGHTLY ~~CARBONACEOUS~~ CALCAREOUS AND SAME AS ABOVE, MODERATE REDDISH BROWN (10 R 4/6), SMALLER AMOUNT OF GRAVEL, NO CARBONACEOUS MATERIAL
	6.3-8.0		Ø							NO SAMPLE
	8.0-10.0		(1) 0.9	GC						SAME AS ABOVE

Box 1 of 3

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SPO 187

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DAT
DATE:
CHECKED BY:

USCS SYMBOL

DATE: 8/8/87

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FOOTAGE	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 3	10.0-10.5		Ø						Eraser of footage		NO SAMPLE
	10.5-12.7		(1) 0.55	GC					11, 12		SANDY GRAVELEY CLAY, MODERATE YELLOWISH BROWN (10 YR 5/4), MOD PLAST, SOME SILT. MAX SIZE GRAVEL = 5.5cm,
13.9	12.7-13.9		(1) 0.35	MH					13		CLAYEY SILT, VERY LIGHT GREY (N8), IRON STAINING, TRACE OF GRAVEL
NO SAMPLE									14, 15, 16, 17		NO SAMPLE
17.7 Box 2 of 3	17.7-20.05		(1) 1.6	MH					18, 19		VFG-FG SANDY SILT, DARK YELLOWISH ORANGE (10 YR 6/6), SOME CLAY

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SP0187

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DAT
DATE:
CHECKED BY:
DATE: 8/8/87
PROJECT NO: 667-11.22

Top/Bottom of Core in Box	Top/Bottom of Core in Box	Sample Number	Feet of Core	USCS Symbol	Fractures per Foot	Fracture Angle	Bedding Angle	Grain Size Distribution	Depth in Feet	Lithologic Log	Lithologic Description
Box 2 of 3	20.05-20.2										NO SAMPLE
	20.2-22.3		(1) 1.7	MH					21, 22		SILT, VERY LIGHT GREY (N8), SOME VFG-FG SAND, EXTENSIVE IRON STAINING, TRACE OF CARB MATERIAL
	22.3-22.7		Ø								NO SAMPLE
	22.7-24.4		(1) 1.25	MH					23, 24		SAME AS ABOVE, SOME CLAY
	24.4-25.2		Ø						25		NO SAMPLE
	25.2-27.6		(1) 1.75	MH					26, 27		SAME AS ABOVE, INCREASING AMOUNTS OF VFG-MG SAND.
27.7 ↓ Box 3 of 3	27.6-27.7		Ø								NO SAMPLE
	27.7-30.2	~~(1)~~ ~~1.6~~	(1) 1.6	MH					28, 29		SAME AS ABOVE; INCREASED AMOUNTS OF CLAY

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SPO 187

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DAT
DATE:
CHECKED BY:

USCS symbol

DATE: 8/8/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
30.2	30.2										SILT, VERY LIGHT GREY (NB); SOME VFG-MG SAND, EXTENSIVE IRON STAINING, SOME CLAY, TRACE OF CARB
END OF BOXES											

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(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 2-87 | BH 3-87

PAGE 1 OF

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:
DATE: 7/27/89

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	USCS SYMBOL	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 to 0.6		5(1)	CL					Clay 50% Sand 20 Silt 20			Sandy silty clay. Dark yellowish brown (10yr 4/2) Low to moderate plasticity Surficial roots and grass present Some $CaCO_3$ mineralization
	0.6 to 2.0		1.1(1)	CL					Clay 75%	1		Clay Pale yellowish brown (10yr 6/2) ~~Some~~ LA Moderate plasticity Some silt Trace roots Trace sand Some $CaCO_3$
	2.0 to 3.6		5.5(1)*	CL					Clay 65% Silt 35%	2, 3		Silty Clay Moderate yellowish brown Moderately high plasticity Trace sand $CaCO_3$ throughout matrix
Box 1 of 2	3.6 to 5.2	SL	1.4(1)*	CL						4, 5		Same as above Trace sand + gravel More $CaCO_3$.
↑ 6.75	5.2 to 6.75	SL	1.6(1)	CL						6		Same as above Increasing $CaCO_3$ content Some carbonaceous material Some iron staining Some gravel
New Box ↓ 6.75 ↓	6.75 to 10.1			CL						7, 8, 9		Same as above grades to weathered Claystone. Pinkish gray (5yr 8/1) to Grayish orange (10yr 7/4) Bedding not ~~apparent~~ apparent Moderate to slightly friable Abundant $CaCO_3$ infilling fractures + throughout matrix (Caliche) Some ironstaining + carbonaceous material Trace gravel. New Box ↓
Box 2 of 2												

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(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

BO Box 1 50-100 cpm

* Blocks in box indicate a sample was [illegible] from this interval

LOG OF BORING NO. 2-87/3-87 BH

PAGE 2 OF

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): UAA
DATE:
CHECKED BY:

USCS symbol

DATE: 7/27/89

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (interval)	SAMPLE NUMBER	FEET OF CORE IN BOX (interval)	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	10.1 to 11.75		1.4* (1)	CL				11		As above, grades to claystone. Pinkish gray (5yr 8/1). Massive(?) bedding. Highly weathered ~~Moder~~ Slightly friable
										No sample 11.75 to 13.25
	11.75 to 13.25		0					12, 13		Claystone. Yellowish gray (5y 8/1) to light brownish gray (5yr 6/1). Massive(?) bedding. Highly weathered slightly friable Iron staining throughout matrix
	13.25 to 14.6		1.5 (2)	CL				14		
	14.6 to 16.0		1.4 (1)	CL				15, 16		Same as above. Abundant Iron staining in vertical fractures. Some possible slickensides in same fractures
								16, 17, 18, 19		Bottom of Boxes.

This description applies interval 13.25 14.1

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

* Marker blocks in box indicate a sample was removed from this interval

LOG OF BORING NO. DH 2-87

GEOLOGIST(S): DCB
DATE: 8/14/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 to 1.5	ND				>50% clay	CL	1		Silty Clay, pale yellowish brown (10 YR 6/2), moderately high plasticity, some roots and plant debris in upper .5 ft., some vfg sand, trace of gravel, local iron staining
	1.5 to 3.0	ND						2		
	3.0 to 3.4							3		
	3.4 to 4.30	ND						4		
	4.30 to 5.8	ND						5		
	5.8 to 7.4	ND						6		
7.4	7.4							7		Silty Clay, grayish brown (5 YR 3/2), moderately high plasticity, trace of vfg sand and gravel.
7.4	7.4 to 11.8	0						8, 9		No Sample

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 2-87

GEOLOGIST(S): DCB
DATE: 8/14/89

PROJECT NO: 667-1R2

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	7.4 to 11.8	0						11		No Sample
11.8	11.8 to ~~14.3~~	0	Weston Sampled Thru Interval					12, 13, 14		No Sample
	14.8									DCB
	14.3 to 14.7	ND				>50% clay				Claystone, light gray (N7), bedding not apparent, highly weathered, moderately friable, abundant iron staining, slight silt fraction.
	14.7 to 15.15	0						15		No Sample
Bot 2 of 2	15.15 to 16.35	ND				>50% clay		16		As above (reference interval 14.3 to 14.7 ft.), iron staining occurs locally.
	16.35 to 17.6	ND						17		Below 16.5 ft and above 17.6 ft. calcareous mineralization occurs locally possibly as fracture filling.
	17.6 to 18.95	ND						18		Claystone, light gray (N7), bedding not apparent, highly weathered, slightly friable.
20.4	18.95 to 20.4	ND						19		
								20.4		

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

Bottom of Box 2 of 2 at 20.4 ft

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SP02-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSO
DATE:
CHECKED BY:

USCS symbol

DATE: 8/8/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 TO 2.0		1.7 (1)	GC					1		Clayey gravel - matrix color is brownish gray (5YR 4/1), angular to subrounded, mod. ~~sort~~ grading, max size = 7cm, some sand
	2.0 TO 3.7		1.75 (1)	GC					2, 3		same as above
	3.7-4.0		0	—					4		No Sample
	4.0 TO 5.7		1.8 (1)	GC					5		Same as above
	5.7 TO 7.0		0	—					6		No Sample
	7.0 TO 7.6		0	—					7		
	7.6 TO 10.1		1.8 (1)	—					8, 9		Cliche - white (N9) to yellowish gray (5Y 8/1), some sand, trace of gravel
↑ 10.1											

Box 1 of 2

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SP02-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD
DATE:
CHECKED BY:

USCS symbol

DATE: 8/8/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN BOX (FT. BELOW GRADE)	SAMPLE NUMBER	FEET OF CORE (INCHES)	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
10.1 ↓	10.1 TO 12.6		ND						11, 12		Same as above (cliche) grading into a V.F.G. TO F.G. sandstone. mottled lt. greenish gray (5GY 8/1) & DK. yellowish orange (10YR 6/6) bedding is nonapparent, highly weathered, mod. to highly friable trace of organic staining, & $CaCO_3$.
BOX 2 of 2 ↑ 15.1	12.6 TO 15.1		ND						13, 14, 15		same as above w/ an increase in $CaCO_3$ at the bottom of the interval
									16, 17, 18, 19		Bottom of Boxes

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 3-87 BR

PAGE 1 OF

GEOLOGIST(S): DCB
DATE: 8/25/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 to 1.5	ND				>50 Clay	CL	1		Silty Clay, grayish brown (5 YR 3/2), moderate plasticity, trace of gravel and roots.
	1.5 to 2.2	ND						2		color grades to grayish orange (10 YR 7/4) and clay becomes calcareous below ~1.7 ft. and silt fraction decreases.
Top of 6	2.2 to 2.8	ND								
	2.8 to 4.5	ND						3		
								4		
Bot of X	4.5 to 6.25	ND						5		
	6.25 to 6.40	ND						6		some caliche precipitated or dispersed in clay below 5.8 ft.
7.30	6.40 to 7.30	ND						7		
7.30	7.30 to 8.9	ND						8		
Bot of 2 of 6	8.9 to 10.5	ND						9		Iron nodule at ~ 9.4 ft.

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 3-87 BR

PAGE 2 OF

GEOLOGIST(S): DCB
DATE: 8/25/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Bot 2nd 6	8.9 to 10.55	ND				>50% clay	CL			Clay as above
	10.55 to 11.0	ND								
	11.0 to 11.7	ND						11		Clay, moderate yellowish brown (10 YR 5/4), moderate plasticity, some silt, trace of gravel
	11.7 to 13.2	ND						12		
	13.2 to 14.75	ND						13		Clay as above, becomes calcareous at ~ 13.0 ft.
14.75	14.75 to 16.0	ND						14		
								15		
	16.0 to 16.4	ND				>50% clay	CL	16		Clay as above (reference interval 11.0 to 16.0 ft), local bodies of caliche.
	16.4 to 18.0	ND						17		
	18.01 to 18.38	ND						18		
	18.38 to 19.38	ND						19		
	19.38 to 19.9	ND								Clay grades to light gray (N7), mottled brown, moderate plasticity

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 3-87BR

GEOLOGIST(S): DCB
DATE: 8/25/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box Hole 6	19.7 to 21.0	ND				>50% clay	CL			(carried from previous page) some iron staining, possibly weathered rock.
	21.0 to 21.2	ND				>50% clay		21		Claystone, light gray (N7), bedding not apparent, highly weathered, slightly friable, local iron staining and mg oxide mineralization.
	21.2 to 24.2	0						22, 23, 24		No Sample
24.9	24.2 to 24.9	ND				>50% clay				Claystone as above (reference interval 20.7 to 21.2 ft.).
Box Hole 6	24.9 to 26.1	ND						25		
	26.1 to 27.8	ND		60°				26, 27		Silty claystone, very light gray (N7), massive bedding, weathered, slightly friable, occasional carb mineralization and iron staining.
	27.8 to 28.5	ND				~75% vf sand ~25% silt		28		Interval grades to silty sandstone at ~28 ft.
	28.5 to 30.2	ND						29		Sandstone, white (N9), bedding not apparent, well weathered, moderately friable, very fine grained, moderately sorted, local iron staining.

See next page for description

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 3-87 BR

GEOLOGIST(S): DCB
DATE: 8/25/89

from previous page 29.0 ft to 30 ft

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 40 ↑ 31.1	28.5 to 30.2	ND				VFG Sand ~75% silt ~25% clay >50%		31		Silty Claystone, mottled light gray (N7) to dark yellowish orange (10 YR 6/6), bedding not apparent, well weathered, slightly to moderately friable, abundant iron staining.
	30.2 to 31.1	ND								
31.1 ↓	31.1 to 31.6	ND								Silty Sandstone, white (N9), bedding not apparent, well weathered, moderately friable, very fine grained, moderately sorted.
	31.6 to 34.7	ND						32 33 34		Silty Claystone, grayish orange (10 YR 7/4), bedding not apparent, well weathered, slightly friable, iron staining locally and on fractures. Interval grades to dominantly light gray (N7)
	34.7 to 35.1	0						35	X	No Sample
	35.1 to 36.1	(1) .7				>50% clay		36		Silty Claystone as above (reference interval 31.1 to 34.7 ft).
	36.1 to 36.6	ND								
	36.6 to 38.4	ND						37 38		
	38.4 to 39.1	0						39	X	No Sample
	39.1 to 40.7	ND				>50% clay				Silty Claystone as above (reference interval 31.1 to 34.7 ft)

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 3-87 DR

GEOLOGIST(S): DCB
DATE: 8/25/89

PROJECT NO: 667-11-22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 50-46 ↑ 40.7	39.1 to 40.7	ND				>50% clay				
	40.7 to 41.4	ND						41		silty Claystone, light gray (N7), bedding not apparent, weathered, slightly friable, iron staining locally and on fractures, occasional carb mineralization.
	41.4 to 44.1	ND			90° 80°			42 43		Claystone, light gray (N7), bedding not apparent, weathered, slightly friable, iron staining on fractures, same silt, occasional carb mineralization. Abundant iron staining at 42.8 to ~51.4 ft.
	44.1 to 47.8	(1) 1.7						44 45 46 47		
	47.8 to 49.5	ND						48 49		color grades to medium gray (N5) at ~ 48 ft.
	49.5 to 51.4	ND								

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 3-87 BR

GEOLOGIST(S): DCB
DATE: 8/25/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	DCB LITHOLOGIC DESCRIPTION
Bot of 6 of 6 ↑ 51.4	47.5 to 51.4	NID				>50% Clay		51		~~Claystone~~ As above
								52		Bottom of Box 6 of 6 at 51.4 ft

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. J-87BR

GEOLOGIST(S): OCB
DATE: 8/22/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
								51		Core Begins at ~ 52.0 ft
52.0 ↓	52.0 to 53.3	ND				>50% clay		52, 53		Claystone, med. light gray (N6), bedding not apparent, well weathered slightly friable, slight silt component, occasional iron stains and carbonaceous mineralization.
	53.3 to 55.5	ND						54, 55		
1st	55.5 to 56.7	ND						56		Claystone - interval grades carbonaceous claystone dark gray (N3) at ~ 56.0 ft.
	56.7 to 58.0	0						57		No Sample
2nd	58.0 to 59.4	ND				>50% clay				Interval grades back Claystone as above (reference interval 52.0 to 56.0 ft)
	59.4 to 59.2	ND						58, 59		
	59.2 to 61.0	ND								slickenside at ~ 60 ft. with 30° dip angle

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 3-87 BR

GEOLOGIST(S): DCB
DATE: 8/22/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Bot 1 of 7 61.0	59.2 to 61.0	ND				>50% clay				As above
61.0 ↓	61.0 to 63.0	ND						61, 62, 63		
	63.0–63.2	ND								
Bot 2 of 7	63.2 to 66.0	0						64, 65, 66		No Sample
	66.0 DCB to 67.0	ND				>50% clay				As above (reference interval 52.0 to 56.0 ft.)
	67.0 to 68.8	ND						67, 68		slickenside at ~ 67.6 ft, attitude ~60° DCB slickenside at ~ 68.2 ft., attitude ~35° DCB dark yellowish brown (10 YR 4/2) to moderate reddish orange (10 R 6/6)
	68.8 to 69.0	ND						69		Siltstone, bedding not apparent, non-friable, well-indurated, abundant iron staining, white mineralization present (gypsum?), interval exhibits claystone with siltstone clasts (subangular to subrounded) in lower DCB .15 ft.
	69.0 to 70.0	ND								

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 3-87 BR

GEOLOGIST(S): DCB
DATE: 8/22/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 7 ↑ 72.0	70.0 to 72.0	ND				>50% clay		71, 72		Claystone, med. light gray (N6), bedding not apparent, slightly friable, slight silt component, occasional iron stains. DCB slickensides at ~~70~~ DCB 73.0 ft. 80°-85° attitude
72.0 ↓	72.0 to 73.0	.65						73		
	73.0 to 74.0	ND								73.9 ft
Box 3 of 7	74.0 to 75.8	ND				>50% silt; >50% clay		74, 75		Siltstone, dark yellowish brown (10 YR 4/2) to moderate ~~DCB~~ reddish orange (10 R 6/6), bedding not apparent, well indurated, iron stained, carbonaceous mineralization present. Claystone as above (reference interval 70.0 to 73.9 ft.)
	75.8 to 77.0	ND						76, 77		
	77.0 to 80.7	ND						78, 79		

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 3-87 BR

GEOLOGIST(S): DCB
DATE: 8/22/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 3 of 7	77.0 to 80.7	ND		35°		>50% clay				claystone As above Fracture at ~ 80.2 ft
80.7	80.7 to 81.0	ND						81		
	81.0 to 83.0	ND						82		Slickensides at ~ 81.3 ft. ~55° attitude
	83.0 to 85.0	0						83, 84, 85		No Sample
Box 4 of 7	85.0 to 89.0	ND				>50% clay		86, 87, 88		Claystone as above (reference interval 70.0 to 73.9 ft)
										slickensides at ~ 87.0 ft 60°-70° attitudes. Interval grades to carbonaceous claystone at ~87.0 ft to ~88.0 ft. grayish black (N3), bedding not apparent, slightly friable, slight silt component.
										Interval grades to claystone, claystone med. light gray (N6), bedding is ~horizontal 2 cm to 1 mm thick weathered, slightly friable, slight to moderate silt component, moderate amount of carb. mineralization
	89.0 to 90.3	ND						89		

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 3-87BR

GEOLOGIST(S): DCB
DATE: 8/22/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
90.3 to 90.3	89.0 to 90.3	ND				>50% clay				Claystone as above
90.3 ↓	90.3 to 93.85	ND						91, 92, 93		
	93.85 to 94.0	0						94		No Sample
	94.0 to 96.8	ND				>50% clay		95, 96		Claystone as above (reference interval 88.0 to 93.85 ft) with local increases in the silt fraction. Faint slickensides at ~ 96.2 ft., attitude ~ 5°
	96.8 to 97.0	0						97		No Sample
	97.0 to 99.1	ND				>50% clay		98, 99		Claystone as above (reference interval 88.0 to 93.85 ft) slickensides at ~ 97.5 ft., attitude ~ 50° color grades to med-dark gray (N4) at ~ 98.0 ft
	99.1 to 100.3	0								No Sample

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 3-87BR

GEOLOGIST(S): DCB
DATE: 8/22/89

PROJECT NO: 667-11-22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 5 of 7 ↑ 101.0	99.1 to 100.3	0								No Sample
	100.3 to 101.0	ND				>50% clay				Claystone, medium light gray (N6), bedding not apparent to ~horizontal thickness not discernable, slightly weathered, slightly friable, slight to moderate silt fraction, moderate amount of carb. mineralization, occasional iron staining
101.0 ↓	101.0 to 103.1	ND						101 102 103		
Box 6 of 7	103.1 to 105.0	ND			~5°	60% silt 35% sand ~5' clay		104		Sandy siltstone, light gray (N7), thin bedded (<2mm), slight dip, slump structures, soft sediment deformation vertical burrow, moderate amount of carb mineralization.
	105.0 to 106.3	ND						105 106		
	106.3 to 107.5	ND			> 5°			107		Clayey siltstone, Medium dark gray (N6), to light gray (N7), bedding not apparent to thin bedded (<2mm) slight dip, weathered slightly friable, local iron staining
	107.5 to 109.0	0						108		No Sample
	109.0 to 110.3	ND			~10°			109		Silty Claystone, medium light gray (N6), bedding not apparent to thin bedded, (<2mm), slight dip, slightly friable, carbonaceous mineralization

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 3-87 BR

GEOLOGIST(S): DCB
DATE: 8/22/87

PROJECT NO: 6671.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 6 of 7 ↑ 110.3	109.0 to 110.3	NO				>50% clay				occurs on partings. Interval grades to claystone with depth
	110.3 to 110.8	1.55								
110.8 ↓	110.8	(1) 1.2						111, 112		claystone medium light gray (N6), bedding not apparent, slight to moderate friability, carb. mineralization on partings, occasional iron stains, slight silt fraction
	112.8									
	112.8 to 113.0	0						113		No Sample
	113.0 to 113.5					>50% clay				claystone as above (reference interval 110.6 to 112.8 ft.)
Box 7 of 7	113.5 to 115.0	NO						114, 115		Interval grades to light gray (N7) with depth
Bot ↑ 117.0	115.0 to 117.0	NO						116, 117		
								118, 119		Bottom of Box 7 of 7 at 117.0 ft.

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SP0387

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 2/11/89
CHECKED BY: DATE:

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INCHES)	SAMPLE NUMBER	FEET OF CORE (INCHES)	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0 0	0 0 to 1.5		ND	GC			>50 Gravel	1		Gravel, medium light gray (N6), angular to subangular, well graded, max size 5cm, some clay, trace of sand and roots. At 1ft. caliche replaces clay matrix
	1.5 to 3.0		0 ~~ND~~ DCB					2, 3		No Sample
	3.0 to 4.0		ND	GC			>50 Gravel	4		As above (reference interval 0.0 to 1.0) no root fragments, max. gravel size 7cm.
	4.0 to 6.3		(1) 1.0					5, 6		Gravel, white (N9) to very light gray (N8), angular to subrounded, poorly graded max. size 5cm, some clay, dark reddish brown (10 d 3/4), with trace of sand and silt
	6.3 to 7.5		0					7		No Sample
	7.5 to 8.6		(1) .6	GP			>50 Gravel	8		Gravel, very light gray (N8) to medium light gray (N6), subrounded, poorly graded, max size 7cm, caliche rind occurs around gravel
	8.6 to 10.3		(1) .3					9		At 8.6 ft the caliche rind is absent otherwise as above with some sand.

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SP0387

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 8/1/94
CHECKED BY: DATE:

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE RECOVERED	USCS SYMBOL	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
10.3	8.6 to 10.3		.3(1)	GP			250			As above
								11, 12		No Sample
12.3	12.8 to 14.4			CL			>50 clay	13, 14		Clay, yellowish gray (5Y 8/1), high plasticity some silt, trace of gravel above 13.0 ft. localized carbonate mineralization
	14.4 to 15.2							15		No Sample
	15.2 to 16.9			CL			>50 clay	16		As above (reference interval XB 13.0 to 14.4 ft)
	16.9 to 17.9							17		No Sample
	17.9 to 19.7			CL			>50 clay	18, 19		As above (reference interval 13.0 to 14.4 ft.) with gradational color change to dark yellowish orange (10 YR 6/6)
20.4	19.7 to 20.4									No Sample to 20.4 bottom of box

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

Box 2/2 at 19.7. Interval blocks run to 20.4.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 4-87

GEOLOGIST(S): DCB
DATE: 8/28/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 to 2.33	ND				50% clay	CL	1, 2		Clay, moderate brown (5 YR 3/4), moderate plasticity, some silt, roots and plant debris, trace of gravel
Box 1 of 3	2.33 to 5.05	(1) 1.7						3, 4, 5		Clay, moderate yellowish brown (10 YR 5/4), moderate plasticity, some silt and roots, slightly calcareous, trace of gravel.
	5.05 to 7.8	ND						6, 7		Clay as above — Roots absent below ~5.5 ft
7.8	7.8 to 10.18	ND				75% clay	CL	8, 9		Interval grades to ~~clayey gravel~~ DCB gravelly clay.
						75% clay	CL			Gravelly Clay, moderate brown (5 YR 4/4), low plasticity (est.) some silt and sand

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible.

see next page

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 4-87

GEOLOGIST(S): DCB
DATE: 8/28/89

PROJECT NO: 667-11-22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	7.8 to 10.18	ND				>50% Clay	CL			(From previous page - description for interval 9.5 to 10.18 ft) Clay, mottled yellowish gray (5Y 7/2) to dark yellowish orange (10YR 6/6), mod high plasticity (est).
	10.18 to 12.8	0						11, 12		No Sample. One medium size gravel (4.5cm) occurs at the base of this interval.
Box 2 of M	12.8 to 15.92	ND				>50% Clay	CL	13		Gravelly Clay, moderate brown (5YR 4/4), low plasticity (est.), some silt and sand.
						>50% clay	CL	14, 15		Clay, grayish orange (10YR 7/4) to moderate yellowish brown (10YR 5/4), moderate to moderately high plasticity, some gravel and silt.
	15.92 to 17.78	ND				>50% gravel	GC	16, 17		Clayey gravel, dominantly light gray (N7), matrix is moderate yellowish brown (10YR 5/4), angular, poorly graded, max size 5cm, some silt and sand.
17.78 Box 3 of M	17.78 to 20.4	ND				>50% clay		18, 19		Highly weathered Claystone. Claystone, light gray (N7), bedding not

Erase 8/28 DCB correct misplace interval indicat

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 4-87

GEOLOGIST(S): DCB
DATE: 8/28/87

PROJECT NO: 667.11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	17.78 to 20.4	N/D				>50% clay				apparent highly weathered, slightly friable, iron staining on fractures and mg oxide mineralization on fractures.
Box 3 of 3	20.4 to	N/D						21 22		
22.9	22.9							23		Bottom of box 3 of 3 at 22.9 ft.

NOTES. General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH ~~0887~~ 04-87

GEOLOGIST(S): DCB
DATE: 8/21/89

PROJECT NO: 667-11-23

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0 0 ↓ Bot 1 of 3	0.0 to 1.7	ND				750' Gravel	GC	1		Sandy Clayey Gravel dominantly med. light gray (N6) matrix is light brownish gray (5YR 6/1), angular to subangular, max size 5cm., some silt, calcareous matrix.
	1.7 to 2.0	0						2		No Sample
	2.0 to 3.5	(1) 1.5				750' Gravel	GC	3		Sandy Clayey Gravel as above (reference interval 0.0 to 1.7 ft) with matrix color change to moderate yellowish brown (10YR 5/4), max size 6cm, calcareous element absent.
	3.5 to 6.0	(1) 1.7						4, 5		
	6.0 to 7.8	(1) 1.0						6, 7		
	7.8 to 10.3	ND						8, 9		Sandy Clayey Gravel as above with color change in matrix to light brown (5YR 5/6), matrix is calcareous.
										change in color of matrix to grayish pink (5R 8/2)

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH0487

GEOLOGIST(S): DCB
DATE: 8/21/89

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 3 10.3	7.8 to 10.3	ND				>50% Gravel	GC			Sandy Clayey gravel as above ~~[illegible]~~ bcb
10.3 ↓	10.3 to 12.8	(1) 4						11, 12		
Box 2 of 3	12.8 to 15.3	(1) 1.8						13, 14, 15		
	15.3 to 17.8	ND				>50% Clay		16, 17		Claystone, yellowish gray (5 Y 7/2), bedding not apparent, highly weathered, slightly friable, body of caliche at ~15.4 ~ 1 cm in diameter local iron staining and occasional mg oxide mineralization
↑ 19.3	17.8 to 19.3	ND						18, 19		
19.3 ↓ Box 3 of 3	19.3 to 20.3	(2) 1.6+								

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 0487

GEOLOGIST(S): DCB
DATE: 8/21/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 3 of 3 20.3	19.3 to 20.3	(2) 1.6+				250 c clay			--- ---	Claystone as above, colour changes to light gray (N7) at ~ 20.0 ft.
								21		Bottom of Box 3 of 3 at 20.3 ft.

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SP04-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY: DATE: 8/9/89

PROJECT NO: 667-11.22

Box 1 of 4 SP04

Depth Interval	Sample Number	Recovery	USCS Symbol	Fracture Frequency	Fracture Angle	Drilling Rate	Depth in Feet	Lithologic Log	LITHOLOGIC DESCRIPTION
0.0–1.6		.8(1)	GC			Gravel >60%	1		Gravel Lt gray (N7) Mostly ~~well rounded~~ subangular to angular artificial surface gravel - Max size ≥ 1 cm Some angular to subangular Poorly sorted Max size 6 cm. Matrix Calcareous Sandy clay Est plast: Low to mod Sand fine to coarse, Some silt.
1.6–2.0		0					2		No Sample
2.0–3.7		.85(1)	GC			Gravel >50%	3		Clayey gravel Gravel med gray (N5) predominantly Angular. Mod to well graded, Matrix dk yellowish brown (10yr 4/2) Est plast mod to high. Some fine sand Mod sorting.
3.7–4.0		0					4		No Sample
4.0–5.3		1.1(1)	GW			Gravel >80%	5		Gravel Med Lt gray (N6) Angular to subangular Mod. graded. 6.5 cm Very little matrix Silty Very calcareous clay Some caliche rinds on gravel
5.3–7.0		0					6, 7		No Sample
7.0–8.7		1.0(1)	GC			Gravel >60%	8		Gravel, as above. More caliche matrix whereas has some biotite
8.7–9.5		0					9		No Sample
9.5–10.1		.5(1)	GW			Gravel >80%			Gravel as above Very little matrix Sandy clay

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SP04-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): UAA
DATE:
CHECKED BY:
DATE: 8/9/89
PROJECT NO: 667-11.22

Top/Bottom of Core in Box	Top/Bottom of Core in Box (Depth)	Sample Number	Feet of Core	USCS Symbol	Fractures per Foot	Fracture Angle	Bedding Angle	Drain Size Distribution	Depth in Feet	Lithologic Log	Lithologic Description
Box 1 of 4	10.1 – 12.0		0						11		No Sample
	12.0 – 14.5		2.9(1)	CL				Clay >80%	12, 13, 14		Clay, yellowish gray (5y 8/1) to dk. yellowish orange (10yr 6/6) Est plast. mod to high Trace CaCO3 Becomes slightly silty to slightly more calcareous toward bottom Trace sand in lenses, trace gravel
Box 2 of 4	14.5 – 17.0		2.5(1)	CL				Clay >80%	15, 16		Clay - same as above Slightly more CaCO3 Begin New Box ↓
	17.0 to 22.0		3.6(1)	CL				Clay >80%	17, 18, 19		Clay - same as above. Silty in some small intervals Trace coins.

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SP04-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:

USCS symbol

DATE: 8/9/89

PROJECT NO: 667-11.22

Depth in feet	Lithologic Description
17.0 to 22.0	Clay - See previous page for description
22.0 – 24.5	Claystone Clay Dk. yellowish orange (10yr 6/6) to Lt brownish gray Mottled Est. plasticity mod to high Some iron staining. Trace carb material
24.5 – 27.0	Claystone Lt. brownish gray (5yr 6/1) Probable horizontal thin bedding ≈ 2cm layers Iron staining + Carb material common. Highly weathered, moderately friable Trace Sand
27.0 – 29.5	Silty claystone Yellowish gray (5y 8/1), to grayish orange (10yr 7/4) Mod. weathered, Slightly to mod. friable.

Box 3 of 4

Box ↓

Depth	Sample	Feet of core	USCS symbol	Fractures per foot	Fracture angle	Bedding angle	Grain size distribution	Depth in feet
17.0 to 22.0								21, 22
22.0 – 24.5		1.65(1)	CL				Clay >80%	23, 24
24.5 – 27.0		1.8(1)					Clay >80%	25, 26
27.0 – 29.5		1.7(1)					Clay 75% Silt >10%	27, 28, 29

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SP04-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): UAA
DATE:
CHECKED BY:
DATE: 8/9/89

PROJECT NO: 667-11.22

Top/Bottom of Core in Box	Top/Bottom of Core in Box (Interval)	Sample Number	Feet of Core (Interval)	USCS Symbol	Fractures per Foot	Fracture Angle	Bedding Angle	Grain Size Distribution	Depth in Feet	Lithologic Log	LITHOLOGIC DESCRIPTION
32.0	32.0	SL	1.85 (1)					Clay >50% Silt >10%	31		Silty claystone yellowish gray (5yr 8/1) to grayish orange (10yr 7/4) Mod weathered slightly to mod friable Trace carb. material. Trace $CaCO_3$ in arcus
32.0			1.8 (1)					Clay >50% Silt >10%	32 33		Silty claystone as above Highly weathered Mod friable. Bedding Not evident. Carb material common Leaf prints visible at top of section
	34.5								34		
37.0	37.0		1.8 (1)					Clay >50% Silt >10%	35 36		Silty Claystone. Very pale orange (10yr 8/2) to pale yellowish brown (10yr 6/2) Color actually near lies between these two (10yr 7/2) Possible horizontal bedding Highly weathered Mod. to highly friable
									37 38 39		Bottom of Boxes

Box 4 of 4

Box 4

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

* This boring was stored in two seperat sets of boxes 3 of 3 (0-23.0ft) and 4 of 4 (23.0-61.0ft)

Boring 5-87BR
Boring 5-87BX

LOG OF BORING NO. 5-87Br

DATES DRILLED
ELEVATION
GEOLOGIST(S) TSD/LAH
DATE
CHECKED BY.
DATE 7/24/89
PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	USCS SYMBOL ~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 TO 4.0		3.5	CL			Clay 70% Silt 30%	1, 2, 3		Silty clay, dark yellowish brown (10 yr 4/2) moderately high plasticity, Some roots Trace Sand and gravel
Box 1 of 3	4.0 TO 8.0		N.D.	CL			Clay >50%	4, 5, 6, 7		Same as above with a gradational color change to pale yellowish brown (10yr 6/2) and dark yellowish orange (10yr 6/6) Increase in sand and gravel content Decrease in root content
↑ 10.0	8.0 TO 10.0		1.5	~~GW~~ GC			50% gravel	8, 9		Top half of interval Same as above Grading into Clayey gravel, predominately light gray (N7) Angular to subangular moderately graded. Maximum size 5cm Some sand

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

βγ = Background = 50-100cpm
βγ Box 1 0-200 cpm

LOG OF BORING NO. 5-87 BR

DATES DRILLED
ELEVATION
GEOLOGIST(S): TSD\LAA
DATE
CHECKED BY.
DATE. 7/24/89

USCS symbol

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
10.0 ft ↓	10.0 to 13.0		1.7 (1)	GC				Gravel >50%	11		Gravel Predominately grayish pink (5R 8/2) Angular to subrounded Poorly graded Maximum size 6 cm. Some sand Trace clay (Top half of interval)
								Clay >50%	12		Claystone - light olive gray (5Y 6/1), massive bedding ? Trace of iron staining in fractures & ~~organic~~ carbonaceous material. highly weathered Slightly friable
	13.0 to 18.0		5.0 (2) N.D.					Clay >50%	13, 14, 15, 16, 17		Same as above with color change to yellowish gray and light olive gray (5y 6/1) [illegible] in iron staining and [illegible] material
Box 2 of 3	18.0 to 19.7		N.D. (2)					Clay >50%	18, 19		Same as above Increase in iron staining in fractures. Fractures primarily vertical
↑ 19.7 ft											
19.7 ↓											

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

Bkg. βγ → 50-100 cpm
Box βγ → 50-225 cpm

LOG OF BORING NO. 5-87 BR

DATES DRILLED
ELEVATION
GEOLOGIST(S): TSD/LA
DATE
CHECKED BY.
DATE. 7/24/89

USCS symbol

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (interval)	SAMPLE NUMBER	FEET OF CORE IN BOX (interval)	~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 3 of 3 → 23.0	19.7 to 23.0		2.0 (1)			90°		Clay >50%	21, 22, 23		Claystone. Top third of interval-yellowish gray (5y 8/1) grading to a medium light gray (N6) Massively bedded (?) Highly weathered Slightly friable Abundant iron staining and fractures in top third, decreasing with depth. Fractures predominantly vertical & Trace carbonaceous material
									24, 25, 26, 27, 28, 29		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

BO Box - 50-150 cpm

LOG OF BORING NO. 5-87 BR

DATES DRILLED
ELEVATION
GEOLOGIST(S) DCB/GCE
DATE: 7/24/89
CHECKED BY: DATE:

USCS symbol

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Top of Box	23.0 to 23.8		ND				CLAY >50'			CLAYSTONE, LIGHT GRAY (N7), HIGHLY WEATHERED, MODERATELY FRIABLE. IRON STAINING ON FRACTURES
	23.8 to 27.0		NO SAMPLE					24.0		NO SAMPLE
	27.0 to 28.3		ND.				>50' clay	27.0 / 28.0		CLAYSTONE. LIGHT OLIVE GRAY (5Y 6/1) HORIZONTAL BEDDING ~ 2mm THICK, HIGHLY WEATHERED, MODERATELY FRIABLE, VERTICAL FRACTURES W/ IRON STAINING
	28.3 to 29.0									NO SAMPLE
	29.0 to 29.2		ND					29.0		AS ABOVE
	29.2 to 33.0		NO SAMPLE					30.0 / 31 / 32		NO SAMPLE

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

βγ 50-150 cpm
βγ BOX 1 50-200 cpm

LOG OF BORING NO. 5-87BR

DATES DRILLED
ELEVATION
GEOLOGIST(S) DOB/GOE
DATE 7/24/89
CHECKED BY: DATE:

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FOOT INTERVAL	SAMPLE NUMBER	FEET OF CORE IN FOOT INTERVAL	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION (USCS SYMBOL)	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	33.0 to 33.8		N.D				>50% clay			AS ABOVE, VERTICAL FRACTURES NOT APPARENT. CARBONACEOUS MINERALIZATION ON BEDDING PLANES, LOCALIZED IRON STAINING, INTERVAL FROM 33.8 TO 34.3 EXHIBITS IRON STAIN SLICKEN SIDES (∠=75°)
	33.8 to 34.3		1.0' (1)		SLICKED SIDES ∠ 75°		>50% clay	34.0		
	34.3 to 38.5		NO SAMPLE					38.0		
	38.5 to 40.2		N.D.		∠=65°		>50% clay	40.0		CLAYSTONE, MEDIUM GREY (N5), HIGHLY WEATHERED, MODERATELY FRIABLE, IRON STAINING ON FRACTURES,
Bottom of Box 42.7	40.2 to 41.5		N.D				"	41.0		
	41.5 to 42.7		N.D.				"	42.0		
TOP BOX 2 of 4	42.7 to 44.0		1.0'				"			AS ABOVE, MODERATELY WEATHERED, MODERATELY FRIABLE, TRACES OF FINE SAND AND

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(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

pg BOX 2 50 - 200 cpm

LOG OF BORING NO. 5-87 BR

DATES DRILLED
ELEVATION:
GEOLOGIST(S) DCB/GCE
DATE 7/24/89
CHECKED BY: DATE:

USCS SYMBOL

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (INTERVAL)	SAMPLE NUMBER	FEET OF CORE (INTERVAL)	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	(cont'd) 42.7 to 44.0	*5.6	1.6'					>50' clay			SILT DISSEMINATED THROUGHOUT,
	44.0 to 44.5		N.D.					50' clay 50' sand	44.0		AS ABOVE IRON STAINED SLICKENSIDES START AT 44.1 to 45.4 CHANGES TO SILTY SANDSTONE (DESCRIBED BELOW)
	44.5 to 45.7		N.D. ~~GCE~~				~~<-18°~~ GCE	>50' sand			~~AS ABOVE, IRON STAINED SLICKENSIDES~~ GCE, ~~44~~ 45 Sandstone YELLOWISH GRAY (5Y 7/12), ~~AND~~ BEDDING 18° < 1-2 mm, MODERATELY WEATHERED, SLIGHTLY FRIABLE, VERY FINE GRAINED VERY WELL SORTED, AT 47.2 BEDDING CHANGES TO HORIZONTAL.
	45.7 to 47.7		N D				<-18°		46.0		↑
	47.7 to 48.0		N D					>50' sand			
Bottom of Box 2 ↓ 50.6	48.0 to 50.6		N.D.					"	48.0		SANDSTONE AS ABOVE, AT 48.6 W/ ABUNDANT CLAY AND IRON STAINING .9 ft THICK INTO 49.5, ~~35 RESUMES~~ GCE AT 49.5 CLAY FRACTION DECREASES.
									50.0		
Top Box 3 (50.6)	50.6 to 52.5		N.D						52.0		Sandstone, moderate yellowish brown (10 YR 5/4), bedding ~~not~~ apparent (massive?) weathered, moderately friable, very fine grained and silty, localized iron staining. Interval grades to a silty claystone at approximately 51 feet.
	52.5 to 54.5		ND								Silty Claystone medium gray (N5), BEDDING < 1 mm THICK, WEATHERED →

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

βγ BOX 3 50-250

LOG OF BORING NO.

5-87 BR

DATES DRILLED
ELEVATION
GEOLOGIST(S) DCB/GCE
DATE 7/24/89
CHECKED BY: DATE.

USCS symbol

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	52.5 to 54.5		ND.						54.0		MODERATELY FRIABLE, IRON STAINING ON BEDDING PLANE PARTINGS, SILT FRACTION DECREASES IN INTERVAL 54.5 to 52.0
	54.5 to 56.0		ND						56.0		SAME
	56.0 to 57.0		ND						57.0		
Bottom of Box 3 59.2	57.0 to 59.2		ND			∠=65°			59.0		CLAYSTONE, MEDIUM GREY (N5), BEDDING < 2 mm THICK, MODERATELY WEATHERED, MODERATELY FRIABLE, IRON STAINING ON FRACTURES, LOCALIZED CARBONACEOUS MINERALIZATION, SLICKENSIDES AT 57.4 ft (ANGLE = 55°) ISOLATED BODIES of COAL < 4mm THICK, LATERALLY DISCONTINUOUS
↑ Top of Box 4 59.2 Bottom of Box 1 61.0	59.2 to 61.0		ND.			∠=65°			60.0		
									61.0		BOTTOM of BOX

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH Ø5-87 ?

Abandoned Hole

GEOLOGIST(S): [illegible]

DATE: ~~8/7~~ 9/1/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
										TOP 1 FT
0.0 ↓	0.0 ~~-70~~ 1.9					100% CLAY				Clay, pinkish gray (5 YR 8/1), mod-high plast, some iron staining as mottles, trace of Mg staining (some roots), trace of silt
						80 ~~100~~% CLAY 20% GRAVEL		1		Bottom 1 FT Same as above, grey pk orange (10 YR 7/4), some gravel, some sand, some calc material, calcareous ~~[illegible]~~ throughout clay
	19-20							2		Same as above
	20-40					80% CLAY 20% GRAVEL				Same as above: no roots
								3		
	40-70					70% CLAY 30% GRAVEL		4		Same as above increased gravel fraction at top of interval
								5		
								6		
	70-120					80% CLAY 20% GRAVEL		7		Same as above: decreased gravel fraction, decreased amt of calc material in top of interval
								8		
								9		

Box 1 of 1

NOTES: General USCS is modified for this log as follows.
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. B- C5-87

abandoned hole

GEOLOGIST(S): JAY

DATE: 9/1/89

PROJECT NO:

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box #1								11		See previous page
								12		
Shelby tubes								13		
								14		
								15		
								16		
								17		
								18		
								19		

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 5-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 7/27/87
CHECKED BY: DATE:

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE RECOVERED	USCS SYMBOL	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 to 2.0		(1) 1.3				>50 clay	1		Clay, mottled, yellowish gray (5Y 8/1), moderate yellowish brown (10 YR 5/4), high plasticity, some silt, and localized carbonate mineralization, trace of gravel, large cobble at DCB 4.0 ft (est.).
	2.0 to 4.0		(1) .4	CL				2, 3		
	4.0 to 4.5		0					4		No Sample
	4.5 to 5.0		ND					5		Clay, grayish orange (10 YR 7/4), high plasticity, some silt and localized carbonate ~~mineralization~~. DCB
1st Box	5.0 to 5.8		ND							
Box	5.8 to 7.5		ND					6, 7		At 6.2 ft a gradational ~~color~~ change occurs. Claystone, medium light gray (N6), bedding not apparent, highly weathered, moderately friable, carbonaceous mineralization occurs locally ~~over 3 ft~~ DCB at 9.0 ft. (est), localized iron staining and iron staining along fractures.
9.3	7.5 to 9.3		(1) .3		DCB ~~FQ~~			8, 9		
9.3 ↓ Box	9.3 to 13.0									

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ND — No Discrepencies in marked core box footage with measured interval footage

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. DH 5-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 7/27/89
CHECKED BY:
DATE:

USCS SYMBOL

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	FEET OF CORE IN ROW	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	9.3										As above (see previous page).
2 of 12 Box	fo		ND						11		
					2/ft at 12 ft	70°			12		
↑ 13.0	13.0								13		
											Bottom of Box 2 of 2 at 13.0 ft.

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SP0587

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): [illegible]
DATE: [illegible]
CHECKED BY:
DATE:

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (IN FEET)	SAMPLE NUMBER	FEET OF CORE	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
[illegible]	[illegible]								1		No Sample
[illegible]	[illegible]		1) .8	GP				>50 Gravel	2	[illegible]	Gravel, light gray [illegible] angular to subrounded, well graded, max size 7cm, some clay, trace of root [illegible]
	[illegible]		1)						3	[illegible]	At [illegible] clay fraction [illegible] gray (N4) to dark reddish brown (10R 3/4), trace of sand.
[illegible]	[illegible]		0						4		No Sample
	[illegible]		0						5		
	[illegible]		1) .5	GC				>50 Gravel	6		
	[illegible]		4(1)						7	[illegible]	~~Gravel, very light gray (N7), [illegible] to subrounded, [illegible] graded, max [illegible] clay, trace of sand~~
									8	[illegible]	Gravel, light gray (N7), subangular, poorly graded, max size 7cm, caliche and occurs on gravel
									9	[illegible]	

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

[illegible]

LOG OF BORING NO. SP 0587

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 2/1/81
CHECKED BY:
DATE:

USCS symbol

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (MT/ACV/A)	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	[illegible]		4(1)	GC				>50% Gravel			As above
	[illegible]		[illegible]					50% Gravel 50% Silt	11		Silty Gravel, light gray N7, subrounded to subangular, poorly graded mass size 6 to [illegible] Silt component is very pale orange (10YR 8/2), trace of fine sand.
	[illegible]		0						12 13		No Sample
	[illegible]		0						14		
	[illegible]		0						15		
	[illegible]		N/D	CL				>50% Clay	16 17		Clay, yellowish gray (5Y 7/2), high plasticity, trace of silt
	[illegible]		N/D						18 19		As above with color change to grayish orange (10YR 7/4) at 14.3 ft through 21.8 ft
	[illegible]		N/D								

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SP0587

PAGE - OF -

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCL
DATE: 2/1/87
CHECKED BY: DATE:

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	21.8			CL				>80% clay	21		As above
									22		Bottom of Box 11 at 21.8 ft

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 6-87A

PAGE 1 OF

GEOLOGIST(S): [illegible]
DATE: 8/23/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 -1.4	NP						1		TOP 1 FT OF INTERVAL ~~SANDY~~ GRAVELLY SANDY CLAY, mod plast, some roots, max sing gravel = 3cm ~~Bottom of interval CLAY~~ Bottom of interval CLAY, pinkish grey (5 YR 8/1), ext mod plast ~~trace~~ = slightly calc, trace of calcite, trace of gravel
	1.4 -5.0	Ø						2, 3, 4, 5		NO SAMPLE
Box 1 of 4	5.0 -9.0	(2) 4.2						6, 7, 8, 9		Same as above greyish orange (10 YR 7/4), top 2/N of interval contains abundant roots & gravel and is pale yellowish brown (10 YR 6/2), bottom of interval ~~is~~ has trace of Mg staining and ~~is~~ has a flowing texture.
	9.0 -12.22	(2) 2.8								Same as above. ~~trace of Mg staining, as flowing texture~~ Some VFG-FG sand lenses (≈ 1-5mm)

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 6-87 A

PAGE 2 OF

GEOLOGIST(S): [illegible]
DATE: 8/23/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 4 ↑ 12.22								11, 12		See previous page
12.22 ↓	12.22 - 14.0	(2) 2.2				60% CLAY 40% SAND		13		SANDY CLAYSTONE, grayish yellow (5 Y 8/4) ~~[illegible]~~, massive bedding, well weathered, mod-poorly friable, some iron staining as mottles, Mg staining, some interbedded sand, ≈ ½-4 in, fine grained, fraction increases at base of interval, 1½ in iron concretion @ 12.5 ft
	14.0 - 17.6	(2) 3.4			10°	65% SAND 35% CLAY		14, 15, 16, 17		CLAYEY VFG-FG SANDSTONE, grayish yellow (5 Y 8/4), 1-2 cm laminations @ ≈10°, well weathered, mod-highly friable, iron staining along bedding planes and as mottles, trace of carb material, sand becomes FG-MG at base of interval and is unconsolidated with less clay
Box 2 of 4 ↑ 18.86	17.6 - 18.86	(2) 0.5				10% CLAY 90% SAND		18		Same as base of above interval
18.86 ↓ Discrepancy between boxes								19		No SAMPLE

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 6-87 A

PAGE 3 OF

GEOLOGIST(S): DAJ
DATE: 8/23/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
DISCREPENCY BETWEEN BOXES ↑ 22.6								21, 22		NO SAMPLE
22.6 ↓	22.6 -24.3	~~NB~~ (1) 1.5				~~100% SA~~ 100% SAND		23, 24		SANDSTONE, greyish yellow (5 Y 8/4), iron-apparent bedding, highly weathered, highly friable, ~~some iron staining~~, ~~FG~~ VFG-MG, subangular-subrounded, mod well sorted ~~[illegible]~~ Top 1 ft is unconsolidated, some iron staining
	24.3 -26.5	(1) 1.7			5°	100% SAND		25, 26		Same as above. 1-2 cm bedding at ≈ 5°, grains are MG-CG at bottom of interval and is unconsolidated
Box 3 of 4	26.5 -27.05	(2) 0.6				100% SAND 100% CLAY		27		~~Same~~ top 2 in: Same as above, abundant iron staining, consolidated bottom of interval; CLAYSTONE, yellowish grey (5 Y 8/1), bedding iron-apparent, well weathered, mod-poorly friable, trace of iron staining
	27.05 -27.6	~~(2) 0.9~~ ~~0~~				100% CLAY		ERASER MUD		No sample
	27.6 -28.4	(2) 0.9		90° 40°		100% CLAY		28		Same as above mod light grey (N6), abundant iron staining filling ~~[illegible]~~ fractures ≈ 90°, 40°
	28.4 -30.0	(2) 1.9		10°		100% CLAY		29		Same as above; mod light grey (N6) and very light grey (N8), bedding @ 10°, some silt

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 6-87A

GEOLOGIST(S): MY
DATE: 8/23/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
↑ 31.5	30.0 -31.5	(2) 1.8				30% CLAY 70% SAND		31		CLAYEY SANDSTONE, greyish yellow (5Y 8/4), bedding horizontal, well weathered, mod. poorly friable, VFG-FG, subangular - subrounded, mod. well sorted, iron staining along bedding planes, trace of carb material
31.5 ↓ Box 4 of 4	31.5 -32.6	ND (1.1)		~90°				32		Same as above, trace of calcite, trace of Mg staining, iron staining is filling in 90° fractures
								33		
								34		
								35		
								36		
								37		
								38		
								39		

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. R-37-6

GEOLOGIST(S): [illegible]
DATE: [illegible]

PROJECT NO: [illegible]

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
[illegible]	[illegible]					90% clay [illegible]	CL	1		Gravelly clay, grey sh orange (10 YR [illegible]), mod-high plast, max [illegible] 3 in, some [illegible] matter, some roots throug out and esp at top of interval [illegible] at ≈ 15 FT, some [illegible], trace of silt, [illegible] grey (LB), [illegible] clasts, slightly calc.
	[illegible]	[illegible]						2		[illegible] as above
								3		
[illegible]	[illegible]-53	1.3						4		Top 4 in [illegible]
								5		[illegible] yellowish brown (10 YR 6/2) [illegible]
	53-73	1.3						6		trace of gravel, trace of sand. [illegible] (10 YR 6/2)
								7		
	73-85	[illegible]						8		[illegible]
	[illegible]	1.6						9		[illegible]

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. B-57-6

GEOLOGIST(S): [illegible]
DATE: 9/5/89

PROJECT NO:

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 2								11		
								12		
	13.0 -14.6 [illegible]	1.[illegible]				30% SILT 70% CLAY		13		Box 1 of 2 (13.0-14.9) [illegible] greyish orange [illegible] [illegible] mod plast, [illegible] [illegible] [illegible] of black [illegible]
	13.0 -13.[illegible] [illegible]							14		
Box 2 of 2						30% SILT [illegible] SAND 60% CLAY		15		Box 2/2 - (13.0 - 15.0); [illegible] w/ gravel as [illegible] max size = 6 cm, [illegible] fraction
								16		
								17		
	17.0 -23.0					70% GRAVEL 30% CLAY		18		CLAYEY GRAVEL, light brown (5 [illegible] 5/6), sub angular - subrounded, mod - poorly graded, max size = 6 cm, some sand, trace of calc material
								19		

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 87-6

GEOLOGIST(S): [illegible]
DATE: 9/5/89

PROJECT NO: 667-1127

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
								21		See [illegible]
								22		
	20.0 - 30.0							23		TOP 2 FT, CLAYEY [illegible], [illegible] (5 YR 5/6), subangular - subrounded, mod - poorly graded, max [illegible], some sand
								24		Bottom of interval (starting at ~25 FT), CLAYSTONE, light olive gray (5 Y [illegible]), massive bedding, well weathered, mod - highly friable, top of interval contains some silt (25 FT - 26.5 FT), abundant microcrystalline with iron staining along fracture planes, some Mg staining
								25		
								26		
								27		
								28		
								29		
30.0										

Box 2 of 3

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SP0687

GEOLOGIST(S): MAY
DATE: 8/11/89

PROJECT NO: 6667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 3	0.0 -1.7	(1) 1.1					CL	1		CALCAREOUS GRAVELEY CLAY, MODERATE YELLOWISH BROWN (10 YR 5/4), MOD PLAST., SOME SAND MAX GRAVEL SIZE = 3 cm. BOTTOM 3 IN SANDY GRAVEL, DARK YELLOWISH BROWN (10 YR 4/2), ANGULAR-SUBANGULAR, MOD GRADED, MAX SIZE = 2.5 cm, SOME ~~SAND~~ ROOTS (NOTE: CORE IS POSSIBLY UPSIDE-DOWN IN BOX)
	1.7 2.0	Ø						2		NO SAMPLE
	2.0 -3.7	(1) 0.5					CL	3		GRAVELEY SANDY (VFG-MG) CLAY, GREYISH ORANGE (10 YR 7/4), MOD PLAST. MAX GRAVEL SIZE = 7.5 cm, SOME ~~CARB~~ CALCAREOUS MATERIAL
	3.7-4.0	Ø						4		NO SAMPLE
	4.0 -5.0	Ø						5		NO SAMPLE
	5.0 -6.5	(1) .65					~~SM~~ GC	6		SANDY GRAVEL, MODERATE YELLOWISH BROWN (10 YR 5/4), ANGULAR-SUBANGULAR, MOD-WELL GRADED, MAX SIZE = 6.5 cm SOME CLAY, SLIGHTLY CALCAREOUS
	6.5-8.0	Ø						7 8		NO SAMPLE
	8.0 -9.5	(1) 1.3					GC	9		SAME AS ABOVE; DUSKY YELLOWISH BROWN (10 YR 2/2), MAX SIZE = 6.0 cm, NOT CALCAREOUS
	9.5 -10.5	Ø								NO SAMPLE

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SP0687

GEOLOGIST(S): DLY
DATE: 8/11/89

PROJECT NO:

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 3	9.5 -10.5									NO SAMPLE
	10.5 -12.9	(1) 1.8					GC	11, 12		CALCAREOUS SANDY GRAVEL, MATRIX COLOR GREYISH ORANGE (10 YR 7/4) ANGULAR-SUBANGULAR, MAX SIZE = 4.5 cm, MOD-WELL GRADED, SOME CLAY
13.0	12.9-13.0							13		NO SAMPLE
DISCREPENCY BETWEEN BOXES		Ø						14, 15		NO SAMPLE
15.5	15.5-16.7	(1) 0.3					GC	16		SAME AS ABOVE
Box 2 of 3	15.5 -18.0	Ø						17, 18		NO SAMPLE
	18.0 -20.5	(1) 4.6		LARGE FRACTURE @ 40° VARIOUS OTHERS			CL	19		TOP 2.5 FT - ~~CALCAREOUS~~ CLAY, YELLOWISH GREY (5 Y 8/1), MOD PLAST., SOME IRON STAINING AS MOTTLES, SOME CALCITE IN FRACTURES AND IN MATRIX (CLAY) SLIGHTLY CALCAREOUS BOTTOM 1.5 FT: SAME AS ABOVE, GREYISH ORANGE (10 YR 7/4), SOME FG-MG SAND

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SP0687

GEOLOGIST(S): [illegible]
DATE: 8/1/89

PROJECT NO:

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
										SEE PREVIOUS PAGE
Box 2 of 3	20.5 -23.0	(1) 30					CL	21, 22		CLAY, LIGHT GREY (N7) AND GREYISH ORANGE (10 YR 7/4), MOD PLAST, SOME SAND, SOME CALCITE AS MOTTLES.
23.0 DISCREPANCY								23		NO SAMPLE
23.2	23.2 -25.7						CL	24, 25		SAME AS ABOVE, NO CALCITE, NO SAND, TRACE OF SILT
Box 3 of 3	25.7 -28.2						CL	26, 27, 28		SAME AS ABOVE LIGHT OLIVE GREY (5 Y 6/1) AND BROWNISH GREY (5 YR 4/1)
	28.2 -30.7						CL	29		SAME AS ABOVE' LIGHT OLIVE GREY (5 Y 6/1), DARK YELLOWISH ORANGE (10 YR 6/6),

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO.

GEOLOGIST(S):
DATE:

PROJECT NO:

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Bot 5 of 5 → 30.7	282 -307									SEE PREVIOUS PAGE
END OF BOXES								31		
								32		
								33		
								34		
								35		
								36		
								37		
								38		
								39		

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 6-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA, DCB
DATE:
CHECKED BY:
DATE: 7/26/89
PROJECT NO. 667-11.22

USCS symbol

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
00 ↓	00 ↓ to ↑ 1.65		16	OL ~~OH~~				>50% clay	1		Silty clay, Dark yellowish brown (10yr 4/2) Low plasticity Some surficial roots. Trace fine sand and fine gravel Gravel to ≈1cm Decreasing silt below 1.65ft
	1.65 to 2.0		.5(2)						2		Increasing calcareous below 2.0'
	2.0 ↓ to 3.05		1.0(2)	CL				>50% clay	3		As above, grades to lighter color beginning at 2.4ft, pale yellowish brown (10YR 6/2); v calc 2.6-4.75'
Box 1 of 2	3.05 to 4.75		1.5(2)	CL					4		As above, continues grading to lighter color 3.45-4.75 - yellowish grey (5Y 7/2) to grey orange (10YR 7/4) As above, med to lrg sub-rounded pebbles 3.7-4.75'
	4.75 to 5.5		1.5(1)	ML				>50% silt 45% clay 5% sand	5		4.75 Clayey silt, mottled color pale yellowish orange (10YR 8/6) to very pale orange (10YR 8/2); calc in spots, some fine to coarse grained sand, moderately graded; mod friable; no apparent bedding, some roots
↑ 7.35	5.5 ↓ to ↑ 7.35		1.5(1)						6 7		
New Box ↓ 7.35 ↓	7.35 ↓ to ↑ 9.0		1.7(2)	ML CL				>50% clay	8		As above, grades to med lt grey (N6) to med grey (N5) 8.25-9.0 Increasing clay to 9.0, decreasing roots Trace silt Calc on partings below 7.9, ~~some~~
	9.0 ↓ to 10.6		1.7(1)	CL				>50% clay	9		9.0 Clay, slightly silty, very lt grey (N-7) to med grey (N5), mod plasticity, no organic material, no bedding evident Calc lens at 9.6, some iron stains on partings

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

Box 1 = 50-100 cpm.

LOG OF BORING NO. 6-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA, DCB
DATE:
CHECKED BY:
DATE: 7/26/89
PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	USCS SYMBOL	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 2	9.0 to 10.6			CL								clay, slightly silty, very lt gray (N7) to med gray (N5), mod plasticity, no organic material, no bedding ~~[illegible]~~ evident; calc on some partings and some iron staining on partings
	10.6 ↓ to ↑ 12.1		1.8 (1)	CL						11		
	12.1 ↓ to 13.5		1.7 (1)	CL						12		
	13.5 ↓ to ↑ 14.3		0.7 (2)	CL						13		
↑ 14.3										14		as above to bottom of run
										15		End Of Boxes
										16		
										17		
										18		
										19		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 7-87 BRA

[redacted]

GEOLOGIST(S): [illegible]
DATE: 8/14/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
00 ↓	0.0 -0.55	ND					SC			CLAYEY SAND, dark yellowish brown (10 YR 4/2), angular-sub-angular, some gravel (max size = 5 cm), some roots & straw
	0.55 -1.0	∅								NO SAMPLE
	1.0 -1.6	ND					CL/CH	1	Erase [illegible]	Clay, moderate yellowish brown (10 YR 5/4), mod-high plast, calc, ~~[illegible]~~, trace of sand, trace of gravel (max size = 3 cm)
	1.6 -2.5	(1) 1.5					CL	2		FG-MG SANDY CLAY, moderate yellowish brown (10 YR 5/4) mod-high plast, ~~some~~ abundant silt, some gravel (max size = 2.5 cm), trace of dark yellowish brown (10 YR 4/2) sandy clay w/ gravel ~~[illegible]~~ as mottle
	2.5 -3.2	(1) 1.5					CL	3		SANDY CLAY, dark yellowish brown (10 YR 4/2) angular subangular, some gravel (max size = 3.5 cm) trace of silt ERASER [illegible]
Box 1 of 6	3.2 -4.6	(1) 1.5					CL	4		SANDY CLAY, greyish orange (10 YR 7/4), angular-subangular, mod-poor graded, trace of gravel (max size = 3.5 cm) mod-high plast, sand ∞ VFG-FG
	4.6 -5.5	(1) 1.0					CL	5		Same as above dark yellowish orange (10 YR 6/6), increased amount of gravel at bottom of interval, sand ∞ FG-MG
	5.5 -6.0	(1) 0.4					GC	6		CLAYEY SANDY GRAVEL, dark yellowish orange (10 YR 6/6), angular-subangular, mod graded, max size = 3.5 cm, portions of interval have large amt of clay
1 7.5	6.0 -7.5	(1) 1.6					CL/CH	7		Clay, yellowish grey (5 Y 8/1), mod-high plast, ~~[illegible]~~ some iron staining as mottles, trace of silt, trace of ~~dark~~ black mineralization
Box 2 of 6	7.5 -8.6	(1) 1.6					CL/CH	8		SAME AS ABOVE, incr amt of silt and some FG sand at bottom of interval
	8.6 -10.5	(1) 1.5					CL/CH	9		Same as above trace of FG sand

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 7-87 BR

GEOLOGIST(S): DAY
DATE: 8/14/87

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 6	8.6 -10.5									See previous page
	10.5 -12.1	ND					CL/CH	11		CLAY, yellowish grey (5 Y 8/1), mod-high plast, some iron staining as mottles, some silt. Bottom of interval color changes to light olive grey (5 Y 6/1), slightly flowing texture
	12.1 -13.7	ND					CL/CH	12, 13		Same as above: consolidated texture.
	13.7 -14.9	ND					CL/CH	14		Same as above; greyish orange (10 YR 7/4) trace of dark mineralization (possible manganese oxide)
↑ 14.9								15		Same as above. light olive grey (5 Y 6/1) iron staining as mottles & in fractures
14.9 ↓ Box 3 of 6	14.9 -16.1	(1) 1.4					CL/CH	16		Same as above: Black mineralization associated with the iron staining
	16.1 -17.6	ND ~~1.65~~					CL/CH	17		
	17.6 -19.1	(2) 1.0					CL/CH	18		Same as above Med light grey (N6), ~~trace of silt~~ some iron staining, trace of silt
	19.1 -20.0	ND					CL/CH	19		Same as above. trace of ~~pocket~~ pockets of silt & VFG sand in 2-3 cm wide, 1 mm thick

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 7-87 BR

GEOLOGIST(S): [illegible]
DATE: 8/14/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 3 of 3 6	20.0 -20.5						CL/CH			Clay, med light grey (N6) ~~[illegible]~~ est. mod plast., trace of iron staining as mottles, trace of silt
	20.5 -22.2	(2) 1.65				70% CLAY 15% SILT 15% VFG	CL	21		Top of interval same as above Bottom (4 IN) of interval, light grey (N7), some abundant silt and VFG-FG sand
↑ 22.2								22		
22.2 ↓	22.2 -23.6	ND						23		SILTY CLAY STONE, yellowish grey (5 Y 8/1), massive bedding, well weathered, mod friable, some sand (VFG-FG) esp. in middle of interval, trace of iron staining as mottles
	23.6 -25.0	(1) 1.6						24		Same as above, yellowish ~~[illegible]~~ grey (5 Y 7/2), in top 8 IN of interval, iron staining in fractures, less silt Bottom of interval, light olive grey (5 Y 6/1) ~~increased silt content~~
Box 4 of 6	25.0 -26.6	ND						25 26		Same as above
	26.6 -28.2	ND						27		Same as above
	28.2 -30.0	ND						28 29		Same as above, trace of black mineralization (possible manganese oxide), ~~[illegible]~~ abundant iron staining in middle of interval.
↑ 30.0										

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO

LOG OF BORING NO. 7-87BR

GEOLOGIST(S): [illegible]
DATE: 8/14/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
30.0 ↓ Box 5 of 6	30.0 -31.7	ND						31		CLAY, olive gray (5 Y 4/1), well weathered, bedding non-apparent, mod friable some iron staining as mottles & concretions,
	31.7 -32.4	(1) 1.7						32		Same as above
	32.4- 34.7	(1) 1.6						33 34		Same as above
	34.7-35.0	ND						35		Same as above
DISCREPANCY BETWEEN BOXES		Ø								NO SAMPLE
Box 6 of 6	35.8 -38.6							36 37 38		Same as above SLAB OF 38.6-39.8: ½-2 IN INTERBEDDING OF THIN (1-2 IN) CLAY BEDS, SANDSTONE IS MASSIVELY BEDDED
	38.6-39.8					40 VFG 20 FG 40 CLAY		39		CLAYEY SANDSTONE, light gray (N6), highly weathered, mod friable, VFG-FG, mod-well sorted, some iron staining as mottles & in fractures, trace of carb. material
	39.8-40.0									NO SAMPLE

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 7-87 B2

GEOLOGIST(S): DAJ
DATE: 8/14/89

PROJECT NO:

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 6 of 6	40.0 -41.0					20 FG 40 VFG 40 CLAY				CLAYEY SANDSTONE, dark yellowish orange (10 YR 6/6), highly weathered, mod friable, VFG-FG, mod-well sorted, subangular-subrounded.
		Ø						41		
								42		
								43		NO SAMPLE
								44		
								45		
								46		
								47		same as above
END OF BOXES								48		
								49		

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH7-87

GEOLOGIST(S): [illegible]
DATE: 8/15/89

PROJECT NO: 667-11 22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
00 ↓	00 -12	ND				GRAVEL =55% SAND =25% CLAY =20%	GC	1		CLAYEY SANDY GRAVEL, brownish gray (5 YR 4/1), subangular - subrounded, mod - well graded, max size = 55 cm, some calc material, some no trace of calcite, trace of non staining,
	12 -3.1	0						2, 3		NO SAMPLE
	31 -48	(1) 1.4				GRAVEL =50% SAND =30% CLAY =20%	GC	4		Same as above, moderate reddish brown (10 R 4/6), max size = 60 cm, non-calc.
Box 1 of 2	4.8 -63	ND					CL/CH	5, 6		CLAY, MOTTLED COLORS OF DARK YELLOWISH orange (10 YR 6/6) and very light grey (N7), mod-high plast, trace of calcite, trace of carb material
	6.3 -80	(1) 1.3					CL/CH	7		Same as above, additional color of yellowish grey (5 Y 8/1)
	80 -9.68	(1) 13					CL/CH	8, 9		CLAY, very light grey (N8), mod-high plast, some carb material, trace of non staining
↑ 9.68										
9.68 ↓	9.68 -11.35	(1) .9					CL/CH			CLAY, olive grey (5 Y 4/1), mod-high plast, trace non staining as mottled, trace of carb material

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 7-89

GEOLOGIST(S): WLY
DATE: 8/15/89

PROJECT NO: 1607-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 2	9.68 -11.35						CL/CH	11		See previous page
	11.35 -13.0	(1) 1.4					CL/CH	12		Same as above light olive gray (5 Y 6/1)
								13		
END OF BOXES								14		
								15		
								16		
								17		
								18		
								19		

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SP0787

GEOLOGIST(S): DCB
DATE: 8/10/89 (+11)

PROJECT NO: 667-122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 to 1.8	(1) .6				>50% Gravel	GC	1		Clayey Gravel, light gray (N7), clay matrix is moderate yellowish brown (10 YR 5/4), angular to sub angular, poorly graded, max. size 5 cm., some plant debris in upper .15 ft., calcareous minerals disseminated throughout matrix, some silt.
1.8 to 2.0		0						2		No Sample
2.0 to 3.8		(1) .4				>50% Gravel	GC	3		As above (reference interval 0.0 to 1.8 ft), without plant debris.
3.8 to 4.0		0						4		No Sample
4.0 to 5.0		(1) .4				>50% Gravel	GC	5		As above (reference interval 0.0 to 1.8), without plant debris, increase in calcareous mineralization - localized bodies of caliche occur in the matrix. Clay matrix grades to med. dark gray (N4).
5.0 to 6.0		ND								
6.0 to 8.0		0						6, 7, 8		No Sample
8.0 to 10.5		(1) .6				>50% Gravel	GC	9		Clayey Gravel, very light gray (N8), clay matrix is medium dark gray (N4), angular to subangular, poorly graded, max size ~5 cm, caliche rind on gravel, local bodies of caliche and calcareous mineralization disseminated in clay matrix, trace of sand and silt.

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SP0787

GEOLOGIST(S): DCB
DATE: 8/10/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
1 of 3	8.0 to 10.5	(1) 1.6				750' Gravel	GC			As above
	10.5 to 11.3	(1) .5				750' Gravel		11		Gravel, very light gray (N8), poorly sorted, angular to subangular, max size 6cm, some clay, trace of sand and silt.
DCB Box ↑ 13.0	11.3 to 13.0	0						12		No Sample (sample jars are found in this interval).
13.0 ↓ Box 2 of 3	13.0 to 14.8	(1) .9				750' Gravel	GC	13 14		Clayey Gravel, light gray (N 8), clay matrix is moderate, yellowish brown (10 YR 5/4), angular to sub angular, poorly graded, max size 4cm, calcareous mineralization disseminated throughout the clay fraction, caliche occurs in local bodies, some silt and sa
	14.8 to 15.5	DCB 0						15		No Sample
	15.5 to 16.6	(1) .5				750' Gravel	GC	16		As above (reference interval 13.0 to 14.8), with an increase in the sand fraction.
	16.6 to 18.0	0						17		No Sample
	18.0 to 19.3	(1) .5						18 19		Silty, Sandy Gravel, grayish brown (5 YR 3/2), matrix is grayish orange (10 YR 7/4), poorly graded, angular to subrounded, max size 3.5 cm, some clay, clacareous.
	19.3 to 20.5	0								No Sample

Eros DCB 8/11/8 correct lith d

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO

LOG OF BORING NO. SP 07 87

GEOLOGIST(S): DCB
DATE: 8/11/87

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	19.3 – 20.5	0								No Sample
Box 2 of 3	20.5 to 23.0	ND				75% Gravel	GC			Interval from 20.5 to 20.8 is as above (reference interval 19.0 to 19.3)
						>50% Clay	CL	21		Interval grades to Clay at ~20.8 ft. Clay, mottled very light gray (N8) to dark yellowish orange (10 YR 6/6), high plasticity, trace of silt, probably highly weathered claystone.
								22		
								23		
	23.0 to 26.0	ND				>50% Clay		24		Claystone, very light gray (N8) to dark yellowish orange (10 YR 6/6), bedding not apparent (massive?), highly weathered, moderately to highly friable, localized iron staining. Contact with clay above is gradational, placement of contact is subjective.
								25		
								26		
Box 3 of 3	25.0 – 26.0							27		
	26.0 to 28.5							28		
	28.5 to 31.0							29		As above, at 28.5 ft the interval becomes light gray (N7)

See Notes

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

Interval 25.0 to 26.0 ft. occurs in both boxes 2/3 + 3/3

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SP0787

GEOLOGIST(S): DCB
DATE: 8/11/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box #3 of 3 31-0						>50% clay				As above
								31		Bottom of Box 3 of 3 at 31 ft. DCB
								32		

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 7-87

GEOLOGIST(S): DAJ
DATE: 8/11/89

PROJECT NO: 6677-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 -1.1	(1) 0.9	~~(1)~~ ~~9.9~~				GM	1		ERASER DAJ CLAYEY SANDY GRAVEL, DUSKY YELLOWISH BROWN (10 YR 2/2), ANGULAR-SUBANGULAR, MOD GRADED, MAX SIZE = 5 cm, CALCAREOUS MATERIAL
	1.1 -1.6	Ø								NO SAMPLE
	1.6 -4.6	Ø						2 3 4		LOST CORE
Box 1 of 1	4.6 -9.35	Ø						5 6 7 8 9		LOST CORE
↑ 9.6		ND					GM			SAME AS ABOVE: LIGHT BROWN (5 YR 5/6), MAX SIZE = 3.5 cm, SLIGHTLY CALC
END OF BOXES (NOTE: BOX HAS WRITTEN - "ABANDONED")										

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 8-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 7/27/89
CHECKED BY: DATE:

PROJECT NO: 667-11.22

USCS symbol

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	(1) .6	DCB	0.0 to 1.2	GC			>40' gravel	1		Clayey Gravel, medium light gray (N6), clay matrix, moderate brown (5 YR 3/4), angular to subrounded, moderately graded, max size 4 cm, some sand and roots.
	ND	DCB	1.2 to 2.0							
	ND		2.0 to 2.4					2		At 2.0 to 3.2 ft. the DCB clay fraction decreases and the DCB gravel becomes coarser, max size 5 cm.
	(1) .6	DCB	2.4 to 3.2							
	(1) .4	DCB	3.2 to 4.2					3		At 3.2 to 4.2 ft the clay fraction increases and the gravel diminishes is size, max size 2 cm.
	0	DCB	4.2 to 4.7	X			X	4	X	No Sample
	(1) 1.3	DCB	4.7 to 6.4	GC / CL			>40' Gravel / >50' clay	5 / 6		As above (reference interval 3.2 to 4.2 ft) for interval from 4.7 to 5.3 ft two large gravel clasts occur in the interval. Gradational change to silty clay. Silty clay DCB settled dark yellowish orange (10 YR 6/6) to very light gray (N8), DCB bedding is 1mm to 6mm and laterally discontinuous. silt and clay appears to intertinger, highly weathered, slightly friable.
	0	DCB	6.4 to 7.0				>50' clay		X	
	ND	DCB	7.0 to 7.4	X				7		
8.9	ND	DCB	7.4 to 8.9		At ~8 ft, 70°			8		claystone, grayish orange (10 YR 7/4), bedding not apparent, (massive?), highly weathered, moderately friable, iron staining occurs locally and along fractures.
3.4 Box 2 of 2	ND	DCB	8.9 to 9.4					9		
	0	DCB	9.4 to 9.6						X	No Sample
	(1) .6	DCB	9.6 to 11.8							Claystone, light gray (N7), bedding

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 8-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 7/27/89
CHECKED BY:
DATE:

USCS symbol

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	9.6 to 11.8		(1) .6				>50' clay	11		(cont'd. from previous page) not apparent (massive?) highly weathered, moderately friable, localized iron staining and carbonaceous mineralization
	11.8 to 12.1		.9 (2)					12		
	12.1 to 13.8		ND					13		
↑ 150	13.8 to 150		ND					14		
								15		
								16		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 8-87 BR

GEOLOGIST(S): LAA
DATE: 8/29/89

PROJECT NO: 1067-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
								41		
								42		
								43		BEGIN BOXES
43.0	43.0	1.55(1)				CLAY 75%		44		SILTY CLAY STONE, lt brownish gray (5YR 6/1) highly weathered, MOD FRIABLE, Bedding NOT EVIDENT, SOME IRON STAINING TRACE $CaCO_3$ (NODULES)
*	44.5									
	45.5	.95(1)				CLAY 75%		45		SAME AS ABOVE, NO $CaCO_3$. VERTICAL FRACTURE, IRON STAINED WITH SLICKENSIDES
	46.0	0						46		NO SAMPLE
Box 1 of 7		3.0(1)				CLAY >50%		47		SAME AS ABOVE. SOME gravel AT TOP OF INTERVAL (subrounded) SOME $CaCO_3$ in nodules
								48		
								49		
	49.7									
	50.0	0								NO SAMPLE

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

* ERASE TO CORRECT DIAGRAM MAP

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 8-87 BR

GEOLOGIST(S): LAA
DATE: 8/29/89

PROJECT NO: 1067-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
50.0 Box 1 of 7 51.5	2.3(1)					CLAY 75%		51		SILTY CLAY STONE, lt brownish gray (5YR 6/1) highly weathered, mod-highly friable. bedding not evident some iron staining in fracture Trace $CaCO_3$
Box 2 of 7	51.5									SAME AS ABOVE
		2.3(1)				Clay 75%		52, 53, 54		
	55.0							55		
	55.0	.95(1)				Clay 75%				SILTSTONE, bluish white (5B 9/1) slightly weathered, slightly to non friable bedding not evident (core is very broken) $CaCO_3$ dust on outsides of pieces
	55.95	1.9(1)				Clay 75%		56, 57, 58		CLAY STONE, lt brownish gray (5 YR 6/1) highly weathered, mod-highly friable bedding not evident vertical fractures with iron staining some carb material some silt
	58.5									
	58.0	0						59		NO SAMPLE
		30(1)		50°		Clay 75%				SILTY CLAYSTONE, SAME AS ABOVE some $CaCO_3$

Begin new Box

NOTES: General USCS is modified for this log as follows.
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 8-87 BR

GEOLOGIST(S): LAA
DATE: 8/29/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 7	59.0↑ 62.2	3.0(1)				Clay >50%		61, 62		SEE previous page
Box 3 of 7	62.2 63.0	0						63		NO SAMPLE
	63.0 64.7	1.7(1)				Clay >50%		64		SILTY CLAYSTONE, lt. olive gray (5Y 6/1) highly weathered, mod FRIABLE. Bedding not evident ~~some~~ Trace IRON STAINING. SOME $CaCO_3$ chalk like ~~gravel~~ MATERIAL AT very top of INTERVAL
	64.7 66.5	1.8(1)				Clay >50%		65, 66		SAME AS ABOVE
	66.5 67.0	0						67		NO SAMPLE
	67.0 69.2	1.75(1)				Clay >50%		68, 69		SAME AS ABOVE, $CaCO_3$ chalk like MATERIAL AT very top of interval SOME CARB. MATERIAL
	69.2 ↓	0								NO SAMPLE

Begin new box

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Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 8-87 BR

GEOLOGIST(S): LAA
DATE: 8/29/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	71.0↑	0						71		NO SAMPLE
73.0	73.0	2.85(2)				Clay >50%		72, 73		SILTY CLAY STONE, lt olive gray (5Y 6/1) highly weathered, mod. FRIABLE Bedding not evident. Trace iron staining. Some $CaCO_3$. SOME CARB. MATERIAL
Box 4 of 7	76.2	2.6(1)		60°		Clay >50%		74, 75, 76		SAME AS ABOVE, with color change to olive gray (5Y 4/1) NO $CACO_3$ SOME slickensides in ~~vertical~~ MF fractures.
	77.0	0						77		NO SAMPLE
	77.0↓	4.3(2)	SL				Clay >50%	78, 79		SILTY CLAY STONE, lt olive gray (5Y 6/1) MOD. weathered, slightly FRIABLE SOME CARB MATERIAL. MASSIVE bedding. SOME very FINE grain sand

Begin new box

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Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible
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ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 8-87BR

GEOLOGIST(S): LAA
DATE: 8/29/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	81.0↑					Clay >50%		81		SEE previous page
	82.3	1.3(2)				Clay 250% sand ≈ 0		82		inter bedded silty claystone & v fg. sandstone pinkish gray (5YR 8/1), to brownish-gray (5YR 4/1). Mod. weathered slightly friable. distorted bedding, possible slump structures and soft sed. deformation.
82.3	85.0	2.7(1)				Clay 775%		83, 84		CLAY STONE, olive gray (5Y 4/1). mod-highly weathered. mod friable. Bedding not evident Abundant CARB material
Box 5 of 7	88.0	2.2(1)				Clay 775%		85, 86, 87		SAME AS ABOVE
	88.0↓	3.5(1)				Clay 750%		88, 89		SILTY CLAY STONE, lt olive gray (5Y 6/1) to olive black (5Y 2/1). Mod weathered, mod. friable. bedding not evident Abundant CARB material silt fraction increases toward bottom of interval color change back to lt olive gray (5Y 6/1). CARB material decreases.

Begin new box

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(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 8-87BR

GEOLOGIST(S): LAA
DATE: 8/29/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	92.0							91, 92		SEE previous PAGE
92.0	94.0	(1) 1.7				Clay >80%, Silt ≈15%		92, 93, 94		Silty Claystone lt brownish gray (5yr 6/1). Mod to highly weathered Mod friable Bedding not evident. Some layers of silt ≈1.5cm (core broken) Trace carb material
	97.2	(1) 4.7				Clay >80%, Silt ≈15%		95, 96, 97		Same as above Some carb material. Some localized iron mineralization.
	98.0	(1) .6				Silt >50%, Clay ≈45%		98		Clayey siltstone. Pinkish gray (5yr 8/1). Slightly to mod weathered Slightly friable Trace carb. material.
	98.7	(1) .35				Clay >80%				Claystone. Olive black (5y 2/1). Mod. weathered, mod. friable. Bedding not evident. Some carb material.
	100.3	1.4	LAA #19			Sand >75%		99		Sandstone Pinkish gray (5yr 8/1) Mod weathered. Mod. to slightly friable. Bedding appears layered. Some carb material, esp toward bottom some silt. Vitig. Sandstone.

Box 6 of 7

Begin new Box

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ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 8-87 BR

GEOLOGIST(S): UAA
DATE: 8/30/89

PROJECT NO:

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
100.3	100.3									
Box 7 of 7	~~165~~ UA 102.0	(1) 165			30°-35°	~~Clay~~ UA Silt ≈45% Sand ≈45%		101 102		Interbedded siltstone + sandstone white (N9) to med. lt. gray (N6) to mod. brown (5yr 4/4) mod weathered. ~~to~~ slightly to non-friable. Thin layers ≈ 4 mm horizontal to slightly tilted. ~~Some~~ UA sand v.f.g. Some carb material. Begin New BL ↓
		(2) 38	SL		30°-35°	Silt ≈45% Sand ≈45%		102 103 104 105		Same as above. Some evidence of dewatering or soft sed deformation. Some iron staining
106.0	106.0							106 107 108 109		Bottom of Boxes

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(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 9-87

GEOLOGIST(S): DCB
DATE: 8/23/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 to 1.2	ND						1		Clay, yellowish gray (5 Y 7/2), moderately high plasticity (CH), some silt and roots, large cobble occurs at ~ 1.2 ft, and caliche precipitate is present at 1.5 ft.
	1.2 to 2.0	0						2		No Sample
	2.0 to 3.8	(1) 1.1						3		Clay, medium light gray (N6) mottled dark yellowish orange (dark yellowish orange (10 YR 6/6), some caliche precipitate.
	3.8 to 5.3	ND						4		Caliche white (N9), some clay
	5.3 to 7.0	ND						5		Interval grades to clay. Clay, mottled, dark yellowish orange (10 YR 6/6) to light gray (N7), moderately high plasticity, calcareous, some silt
	7.0 to 8.45	ND						6		Clay, grayish brown (5 YR 3/2), grades to light olive gray (5 Y 6/1), high plasticity, calcareous, trace of silt and occasional bodies of caliche precip. DCB
8.45 Box 2 of 2	8.45 to 10.2	ND						7		
								8		
								9		

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Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 9-87

GEOLOGIST(S): DCB
DATE: 8/23/89

PROJECT NO: 667-11-22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 2 ↑ 150	9.45 to 10.2	ND								
	10.2 to 11.0	ND				>50% clay	CL			Clay as above
	11.0 to 11.53	ND						11		
	11.53 to 13.13	ND				>50% clay		12		Clay stone light gray (N7), bedding not apparent, well weathered, slightly friable, local iron staining and mn oxide mineralization, occasional caliche precipitate.
	13.13 to 14.43	ND						13		
	14.43 to 15.0	(2) 35						14		
								15		Bottom of Box 2 of 2 at 15.0 ft.
								16		

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(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 9-87
BH 29-87

PAGE 1 OF 5

GEOLOGIST(S): UAA
DATE: 8/28/89

PROJECT NO: 4.7-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 – 1.45	1.2 (1)				Gravel >50%	GC	1		Clayey Gravel Very Lt. gray (N8) Angular, mod. to well graded Granules to 4.5 cm. Matrix sandy clay Mod. brown (5yr 4/4 to 3/4) Est plast low to mod Sand v f g. to v. c g
	1.45 – 2.0	0				~~Gravel >50%~~ UA	~~GC~~ UA	2		No Sample
	2.0 – 2.2	.25 (1)				G>50%	GC			Clayey gravel White (N9) Angular to sub angular poorly graded Max size 8 cm Silty clay matrix Mod yellowish brown (10yr 5/4) Est plast low to mod Some sand v.c g. to granules
	2.2 – 3.0	8 (1)				Gravel >50%	GC	3		Same as above
	3.0 – 4.0	.6 (1)				Grav >50%	GC	4		Same as above, max size 6cm
	4.0 – 4.2	0								No Sample
	4.2 – 5.0					Grav >50%	GC	5		Same as above, max size 5 cm Mod graded
	5.0 – 6.0	0						6		No Sample
	6.0 – 6.6	1.2 (1)				Gravel >50%	GC			Same as above
	6.6 – 7.5	2 (1)				Gravel >50%	GC	7		Same as above
	7.5 – 9.5	1.5 (1)				Gravel >50%	GC	8, 9		Same as above max size 6.5 cm
	9.5 – 11.5 ↓									See next page for description

Box 1 of 4

NOTES. General: USCS is modified for this log as follows:
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(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 9-87

BH 29-87

GEOLOGIST(S): UAA
DATE: 8/28/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
11.5	9.5 to 11.5	.4(1)	UAA #18			Sand 70%	SW SM	11		Sand, Lt Brown (5yr5/6) med grained to granules Subrounded to rounded, mod well graded Some silt Some gravel. rounded, granules to 3 cm Poorly graded. Some clay
	11.5 115 12.5	○						12		No Sample — Begin New Box
Box 2 of 4	12.5 17.5	*						13 14 15 16 17		* This section of core was all in sample jars, was not logged
								18 19		Please see next page for description ~~Begin~~ UA beginning at 17.5'

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(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 9-87 / BH 29-87 PAGE X3 OF 5 LA

GEOLOGIST(S): DCB
DATE: 8/29/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
								16		
								17		
17.5 ↓ Box 2 of 4 continued.	17.5 to 19.5	(1) .4				~50% clay ~50% fg sand	~~SW~~ DCB SP	18 19		Claystone and Sand~~stone~~ DCB. Claystone, light gray (N7), bedding not apparent, well weathered, slightly friable, iron stained vfg sand forms a "rind" on of claystone fragments. Sand is ~~fine~~ DCB grayish orange (10 YR 7/4), fine grained, subrounded to rounded, ~~moderately sorted~~ DCB poorly graded. Sand descriptor above is for loose sand in this interval not for sandy "rind" on the claystone.
	19.5 to 20.0	0						20	X	No Sample
	20.0 to 21.5	ND	DCB-10			~~>~~90% vfg sand <10% fines	SP	21		Sand, very pale orange (10 YR 8/2), subrounded to rounded, ~~well~~ DCB poorly graded, vfg.
	21.5 to 22.5	0						22	X	No Sample
	22.5 to 24.0	ND				>90% vfg sand <10% fines	SP	23 24		Sand as above (reference interval 20.0 to 22.5), color changes to grayish orange (10 YR 7/4).
	24.0 to 25.0	0							X	No Sample

NOTES. General: USCS is modified for this log as follows:
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(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 9-87/BH 29-87

PAGE 4 OF 5

GEOLOGIST(S): DCB
DATE: 8/29/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
25.0 ↓ 25.0 x 20.4 ↑ 27.5	25.0 to 27.5	1.3				>90% vf sand 40% fines	SP	26, 27		Sand as above (reference interval 20 to 21.5 ft.) color very pale orange (10 YR 8/2)
27.5 ↓	27.5 30.0	0						28, 29, 30		No Sample
Box 3 of 4								31, 32, 33, 34		please see next page for description beginning with 30.0'.

Begin New Box

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 9-87

BH 29-87

GEOLOGIST(S): UAA

DATE: 8/29/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
30.0	30.0					SW	Sand >70%			Sand Grayish orange (10yr 7/4) ~~Medium~~ well graded. Silt sized to granule sized Rounded grains. Trace clay
						CL	Clay >70%	31		Clay Very lt gray (N8) Est plast mod. to high Some iron staining in fractures Some carb material
		2.6(1)				SM	Sand >50%			Silty sand + gravel Dk yellowish orange. Sand v.f.g to granules. rounded well graded Gravel to 1.5 cm Subangular to rounded Some clay
	32.5						Clay >50%	32		Silty Clay stone. Very pale orange to grayish orange (10yr 8/2 to 10yr 7/4) Mod ~~weathered~~ mod. friable Some iron staining, some carb material Bedding appears horizontal
		2.9(1)				Clay >50%		33		Same as above Some sand v.f.g. to coarse grained, in patches
	35.0							34		
		2.3(1)				Clay >50%		35		Same as above.
37.5	37.5							36		
								37		
								38		Bottom of Boxes (Box 4 of 4 Missing)
								39		

Box 3 of 4

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 14-87 BR

GEOLOGIST(S): DCB
DATE: 7/20/89

PROJECT NO: 6617-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 to 1.8	1.8 (1)				>50% Clay	OL, CL	1		Silty clay, dusky yellowish brown (10 YR 2/2), moderate plasticity, some gravel + organic detritus. At ~1 ft this interval grades to a silty clay, moderate yellowish brown (10 YR 5/4) moderate plasticity, some fine sand + carbonate mineralization is disseminated throughout.
	1.8 to 2.0	0						2		No Sample
	2.0 to 4.0	1.8 (1)					CL	3, 4		As above reference interval below 1 ft, carbonate mineralization occurs in laminar stringers 1mm and less in thickness and as isolated bodies.
Box 1 of 4	4.0 to 5.2	0.7 (1)					CL	5		As above. Note: a badly broken 0.3 ft interval labeled 4' shoe occurs above interval marked 4.0' to 5.2'.
	5.2 to 7.0	2.45 (1)					CL	6		As above, clay is mottled moderate yellowish brown (10 YR 5/4) to dark yellowish orange (10 YR 6/6) with an increase in carbonate mineralization.
↑ 9.0	7.0 to 9.0	1.75 (1)					CL	7, 8, 9		As above
8.0 ↓ Box 2 of 4										Note: An interval of 1 ft (as above) occurs at the top of this box and is labeled 8.0 to 9.0. See next page for 9' to 12' description.

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible

This page has been re-copied to include correct graphic lithologic log. CKF

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 14-87 BR

DATES DRILLED
ELEVATION
GEOLOGIST(S) DCB/GCE
DATE 7/20/89-7/21/89
CHECKED BY DATE

USCS symbol

PROJECT NO 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (interval)	SAMPLE NUMBER	FEET OF CORE IN BOX (interval)	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 4	9.0 to 12		(1) 3.0					FG to VFG >50%	11		Sandstone, yellowish gray (5Y 8/1), bedding not discernable, heavily weathered, moderately friable, fine grained to very fine grained, subrounded to rounded, well sorted, localized iron staining occurs at ~11.5 to 12'.
			0						12		
	12.5 to 14.5		(1) 2.6					VFG >50%	13, 14		Sandstone, yellowish gray (5Y 7/2), silt fraction some coloration, bedding not discernable, weathered, moderately friable to slightly friable, very fine grained, some carbonate mineralization occurs locally, iron oxide staining occurs locally, ~~some~~ trace of clay
↑ 16.5	14.5 to 16.5		(1) 2.0					VFG >50%	15, 16		As above
16.5 ↓ 7/21/89	16.5 to 17.5		1.35' (2)					VFG >50% CLAY ~45%	17		AS ABOVE, DECREASE IN CARBONATE MINERALIZATION. CLAY FRACTION INCREASES. GROUND SAMPLE EXHIBITS MODERATE PLASTICITY
Box 3 of 4	17.5 to 19.0		2.05' (2)					VFG >50%	18		SANDSTONE, GREYISH ORANGE (10YR 7/4) BEDDING NOT DISCERNABLE, WEATHERED, MODERATELY FRIABLE, FINE GRAINED PORTION IS SUBROUNDED TO ROUNDED, WELL SORTED, SOME SILT AND CLAY
	19.0 to 19.5		.4' (1)					MG >50%	19		SANDSTONE, PINKISH GREY (5YR 8/1), FRIABLE, MED. GRAIN, SUBROUNDED TO ROUNDED, WELL SORTED, SOME FG SAND AND SILT, ~~[illegible]~~ >CB
	19.5 to 22.5		2.65' (2)					MG >50%			As above with a gradational

NOTES. General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

SL - TO BE SLABBED
GS - " " ANALYZED
NOT APPLICABLE

FIGURE NO.

38 BACKGROUND 50-185 cpm
Box 3 20-190 cpm

LOG OF BORING NO. 14-87

~~DATES DRILLED~~
~~ELEVATION~~
GEOLOGIST(S) PCTS
DATE 7/21/89
CHECKED BY
DATE

USCS symbol

PROJECT NO 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (interval)	SAMPLE NUMBER	FEET OF CORE IN BOX (interval)	~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	19.5 to 22.5 (contd)		(contd) 2.65' (1)					>50% Clay	21, 22		Change at ~2/3 of this interval. ~~Siltstone~~, LIGHT OLIVE GRAY (5Y 6/1), CONTAINS DISCONTINUOUS BEDS of SILTSTONES, (< 1mm thick), WEATHERED, MODERATELY FRIABLE, LOCALIZED STAINS of IRON OXIDE,
↑ 23.8	22.5 to 23.8		1.45' (1)					MG >50%	23		SANDSTONE, GREYISH ORANGE (10YR 7/4), BEDDING NOT APPARENT, HIGHLY WEATHERED, HIGHLY FRIABLE, SUBANGULAR TO WELL-ROUNDED, POORLY SORTED.
23.8 ↓ Box 4 of 4 ↑ 25.5	23.8 to 25.5 ↓	*SL	2.75' (1)					SILT 50% FG-MG 50%	24, 25		SANDSTONE ~~FINE TO MEDIUM~~ YELLOWISH GREY (5Y 7/2), BEDDING NOT VISIBLE, HIGHLY WEATHERED, MODERATELY FRIABLE, MEDIUM TO FINE GRAIN SAND, ROUNDED, POORLY SORTED, ABUNDANT SILT AND CLAY, INTERVAL GRADES TO CLAYSTONE AT APPROX. 24.5' (SAME COLOR), THIN HORIZONTAL BEDDING LESS THAN 2 mm, WEATHERED.
									26, 27, 28, 29		Bottom of Box 4

NOTES. General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

βγ BACKGROUND 50-185 cpm
BOX 4 50-150 cpm

LOG OF BORING NO. SP 09-87 PAGE 1 OF

GEOLOGIST(S): DCB
DATE: 8/30/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 to 1.5	(1) 1				750% clay	CL	1		Clay, dark yellowish brown (10 YR 4/2), moderate plasticity, some silt and gravel, trace of roots.
	1.5 to 3.0	(1) .7						2		Gravel, dominantly light gray (N7), matrix is moderate yellowish brown (10 YR 5/4), angular poorly graded, max. size 5.5 cm, some clay and sand.
Box 1 of 2	3.0 to 6.0	(1) 1.4						3, 4, 5		
	6.0 to 8.5	ND						6, 7, 8		Clay, grayish orange (10 YR 7/4), moderately high plasticity, local iron staining, body of caliche at 3.2 ft. ≈ 2 cm. in diam., interval grades to light gray (N7) below ~6.8 ft. DCB
	8.5 to 11.0	(1) 1.8						9		Interval grades to highly weathered claystone at ~6.8 ft. Claystone light gray (N7), bedding not apparent, highly weathered, slightly friable, local iron staining, slight silt fraction

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SP 09-87

GEOLOGIST(S): DCB
DATE: 8/30/89

PROJECT NO: 667-112

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 2 ↑ 11.0	8.5 to 11.0					>50% clay		11		claystone as above
								12		Box SP 09-87 1 of 2 ends at 11.0 ft.

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 10-87

DATES DRILLED
ELEVATION
GEOLOGIST(S) TSD/DCB
DATE 7/18/89
CHECKED BY DATE 7/19/89

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION (USCS symbol)	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 to 1.0		.93				5.5cm +5.5cm 2mm 70% VCG to MG 30% FG	1		Gravel, light gray (N7) and grayish orange pink (10 YR 8/2), angular to subrounded, low to high sphericity, poorly graded, some clay, grayish brown (5 YR 3/2), trace ~~of~~ roots
	1.0 to 2.0		0							No Sample
	2.0 to 2.6		.63			2cm	2cm-2mm =60% VCG=15% FG=25%	2		Gravel-Grayish pink (5R 3/2) to light brown sh gray (5YR 6/1), angular to subangular, sphericity = low to high, well graded, some clay silt, + sand.
Box 1 of 2	2.6 to 5.0		0				5.5cm 2.0mm =60% VCG TO FG=30% <FG =10%	3 4		No Sample
	5.0 to 7.0		1.82					5 6		Sandy Gravel - light gray (N7) angular to subrounded, low to high sphericity, moderately graded, some calcarious mineral [illegible]
	7.0 to 9.0		1.85				5.0cm 2.0mm =60% VCG TO FG-30% <FG= 10%	7 8		Same as above with ~~gravel color~~ some clay occuring from approximately 8.4 ft to [illegible]
	9.0 to 10.5		1.53					9		Same as above including clay fraction.

NOTES General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 10-87

DATES DRILLED
ELEVATION
GEOLOGIST(S) TSD/DCB
DATE 7/18/89
CHECKED BY
DATE

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (interval)	SAMPLE NUMBER	FEET OF CORE IN BOX (interval)	USCS symbol	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	9.0 to 10.5		1.53									
			0							11		No Sample
Box 1 of 2 ↑ 13.0	11.0 to 13.0		1.85							12		Same as above to 11.3 ft. At 11.3 ft very weathered fine to very fine silty sandstone - white (N9) & dark yellowish orange (10YR (6/6) stained) some calcareous mineralization & black (carbonaceous?) mineralization. Some horizontal bedding 3-<1 mm thick.
13.0 ↓	13.0 TO 15.0		1.7 (2)							13		Same as above
Box 2/2 ↑ 17.0	15.0 TO 17.0		1.75 (2)							14		Same as above with decreasing amounts of staining & calcareous mineralization with depth. Note: Interval blocks for 15' to 17' appear to be reversed based on color gradation between 15'-17' int and 13' to 15' interval
										15		
										16		
										17		Bottom of box 17.0'
										18		
										19		

NOTES General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 10-87

GEOLOGIST(S): TSD/DCB
DATE: 7/18/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓ Box 1 of 2	0.0 To 1.0	0.93				55cm to 2mm 70% VCG to MG 10% Fines 20%		1		Gravel, light gray (N7) and grayish orange pink (10 R 8/2), angular to subrounded, low to high sphericity, poorly graded, some clay, grayish brown (5 YR 3/2), trace of roots.
	1.0 To 2.0	0						2		No Sample
	2.0 to 2.6	0.63				2cm-2mm =60% VCG=15% Fines=25%				Gravel-Grayish pink (5 R 8/2) to light brownish gray (5 YR 6/1), angular to subangular, sphericity = low to high, well graded, some clay, silt, + sand.
	2.6 to 5.0	0				55cm-2mm =60% VCG to FG=30% LFG =10%		3, 4		No Sample
	5.0 to 7.0	1.82						5, 6, 7		Sandy Gravel - light gray (N7) angular to subrounded, low to high sphericity, moderately graded, some calcareous mineralization
	7.0 to 9.0	1.85				5.0cm-2.0mm =60% VCG to FG=30% LFG= 10%		8, 9		Same as above with some clay occuring from approximately 8.4 FT to 9.0 FT.
	9.0 to 10.5	1.53								Same as above including clay fraction.

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

This log has been recopied to include correct graphic lithologic log. CKF

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 1087

GEOLOGIST(S): TSD/DCB
DATE: 7/18/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	9.0 to 10.5	1.55								
Box 1 of 2		0						11		No Sample
	11.0 to 13.0	1.85						12		Same as above to 11.3 Ft. At 11.3 Ft very weathered fine to very fine silty sandstone - white (N9) + stained dark yellowish orange (10 YR 6/6) some calcareous mineralization + black (carbonaceous?) mineralization some horizontal bedding 3 - < 1 mm thick
↑ 13.0								13		
13.0 ↓	13.0 to 15.0	1.7 (2)						14		Same As Above
Box 2/2	15.0 to 17.0	1.75 (2)						15		Same as above with decreasing amounts of staining + calcareous mineralization with depth. Note: interval blocks for 5' - 17' appear to be reversed based on color gradation between 15'-17' int. and 13' to 15' interval.
↑ 17.0								16		
								17		Bottom of Box 17.0'
								18		
								19		

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SP 10-87

GEOLOGIST(S): UAA
DATE: 8/10/89

PROJECT NO: 6674122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 – 1.8	(1) .7				Clay >50% Silt ≥10%	CL	1		Silty gravelly clay Dk yellowish brown to dk. yellowish orange (10yr 4/2 to 6/6.) mottled. Est. plast. low to mod. Gravel angular to sub angular Poorly sorted. max size. 5cm Surficial grass & roots Calcareous
	2.0 – 3.8	(1) 1.4				Clay >50% Silt ≥20%	CL	2, 3		Silty Clay Very pale orange to dk yellowish orange (10yr 8/2 to 6/6) Est plast. low to moderate Calcareous Some gravel. (to 3 5cm) Sub rounded Trace roots
	4.0 – 5.0	(1) .65				Clay >50%	CL	4		Same as above
	5.0 – 7.0	(1) 1.6				Clay >50%	CL	5, 6		Same as above Less gravel Very Slightly Calcareous
	7.0 – 9.0	(1) 1.7				Clay >50% Silt >20%	CL	7, 8		Same as above. Slightly siltier
	9.0 – 11.0	(1) 1.8				Clay >50% Silt ≥20%	CL	9		Same as above Trace organic material

Box 1 of 3

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SP 10-87

GEOLOGIST(S): UAA
DATE: 8/10/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 3	9.0 to 11.0	(1) 1.0				Clay >50%	CL			See previous page for description
	11.0 to 13.0	(1) 1.85				Clay >50% Silt ≈30%	~~CL~~ UA	11, 12		Silty Claystone Lt. Olive gray (5y6/1) Highly weathered. Bedding not evident moderately friable Some iron staining Trace carbonaceous material
Box 2 of 3	13.0 to 15.0	(1) 1.4				Silt >50%	~~Mt~~ UA	13, 14		Clayey siltstone Yellowish gray (5y 8/1). Some grayish orange to dk yellowish orange 10yr 7/4 to 6/6 Highly weathered Mod friable. Bedding not evident. Some iron-staining in sm fractures
	15.0 to 17.0	(1) 1.4				Silt >50%	~~Mt~~ UA	15, 16		Same as above
	17.0 to 19.0	(1) 1.4						17, 18		Same as above Grades to silty claystone @ bottom of interval
	19.0 to 21.0	(1) 1.8						19		Silty Claystone. Yellowish gray to dk yellowish orange (5y8/1) to 10yr 6/6 Highly weathered. Mod friable. Bedding not evident. Some iron staining in small fractures. Very slightly calcareous

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SP10-87

GEOLOGIST(S): LAA
DATE: 8/10/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
										See previous page for description.
	21.0									
Box 3 of 3	21.0							21		Claystone lt olive gray (5y 6/1). Highly weathered slightly friable Bedding not evident Iron staining and $CaCO_3$ mineralization in small healed fractures
		16						22		
	23							23		
22.7										Same as above Extremely weathered, highly friable. ~~was~~ lt Core completely crumbled
	23.7	115								
								24		Silty Claystone lt brownish gray to brownish gray (5yr 6/1 to 5yr 4/1) Highly weathered mod. friable. Trace iron staining Bedding not evident.
		26						25		
	25.7									
								26		Same as above Some carbonaceous material. Possible horizontal bedding
		18.5						27		
↑ 27.7	27.7	x	x	x	x	x	x	x	x	x x x x x x
										Bottom of Boxes
								28		
								29		

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Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 10-87 BR

DATES DRILLED:
ELEVATION
GEOLOGIST(S): DCB/GCE
DATE 7/24/89
CHECKED BY
DATE

USCS SYMBOL

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
TOP BOX 1	0.0 to 1.2		N.D. (1)	GW			GRAVEL >50%	1.0		UPPER 2 FT OF INTERVAL IS ~~CLAY~~ SILT, GCE, MODERATE BROWN (5 YR 3/4), TRACE OF CLAY AND GRAVEL, ABUNDANT ROOTS. REMAINDER OF INTERVAL IS GRAVEL LIGHT GRAY (N7), ANGULAR TO SUBROUNDED, WELL GRADED, SOME CLAY AND SILT, AT 1 4 FT CHANGES TO SANDY GRAVEL, MATRIX IS MODERATE YELLOWISH BROWN (10 YR 5/4), GRAVEL HAS VARIGATED COLORATION; DOMINANT IS LIGHT GRAY (N7), ANGULAR TO SUBROUNDED, WELL GRADED, SOME SILT TRACE OF CLAY
	1.2 to 3.2		N.D (1)	GW				3.0		
	3.2 to 4.0		1.0'	GW				4.0		
	4.0 to 8.4		NO SAMPLE	NO SAMPLE				8.0		NO SAMPLE
	8.4 to 10.3		N.D.	GP			GRAVEL >50%			CLAYEY GRAVEL, VARIGATED COLORING, DARK GREY (N3) AND MODERATE ORANGE PINK (10R 7/4), ANGULAR TO SUBANGULAR, POORLY GRADED, CARBONATE MINERALIZATION OCCURS BETWEEN GRAVEL

NOTES. General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

βγ BACKGROUND 50 - 150
BOX 1 40 - 150

LOG OF BORING NO. 10-87 BR

DATES DRILLED:
ELEVATION
GEOLOGIST(S): DCB/GCE USCS symbol
DATE 7/24/89
CHECKED BY: DATE:

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN BOX (FT. BELOW GROUND SURFACE)	SAMPLE NUMBER	FEET OF CORE RECOVERED (INDICATE % IN BOX)	~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	8.3 to 10.3		↑							↑ SEE ABOVE
↓	12.3 to 10.7						CLAY >50%			SANDY CLAY, LIGHT BROWN (5YR 5/6), MODERATE PLASTICITY, SOME GRAVEL
10.70 to 10.80 + 10.82								11		10.80 to 10.92; 1 COBBLE, MEDIUM LIGHT GRAY, 6 cm
Bottom of BOX			NO SAMPLE					12		NO SAMPLE
TOP of 2nd 13.5								13		
13.8				~~60~~			SAND ≥ 50%			GRAVEL, MEDIUM DARK GREY (N4), ANGULAR, POORLY GRADED, MAX SIZE = 6 cm. SANDSTONE VERY LIGHT GRAY (N8), BEDDING NOT APPARENT, WEATHERED, MODERATELY FRIABLE, VERY FINE GRAINED, WELL SORTED, LOCALIZED IRON STAINING, CARBONACEOUS MINERALIZATION
	13.5 to 14.7		N.D.				GRAVEL ≥ 50%	14		
	14.7 to 18.1							15		BELOW 14.1 SANDSTONE AS ABOVE.
								16		NO SAMPLE
								17		
								18		
	18.1 to 18.9		N.D							SANDSTONE AS ABOVE.
	18.9 to 19.8		1.6' (1)					19		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

BOX 2 50 - 100 cpm

LOG OF BORING NO. 10-87 BR

DATES DRILLED:
ELEVATION
GEOLOGIST(S) DCB/GCE
DATE 7/29/89
CHECKED BY: DATE:

USCS symbol

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Bottom of Box 2 22.4 ↓	19.8 to 20.6		Cont'd							SANDSTONE AS ABOVE
	20.6 to 21.5		.9' (1)					21.0		
	21.5 to 22.4		1.8' (2)					22.0		
	22.4 to 22.8		X						X	NO SAMPLE
↑ Top of 3 (22.8)	22.8 to 24.8		ND.					23.0 / 24.0		SANDSTONE AS ABOVE
	24.8 to 26.7		N.D.					26.0		
	26.7 to 27.5		N.D					27.0		SILTSTONE, MOTTLED, GREYISH ORANGE (10YR 7/4) AND DARK YELLOWISH ORANGE (10 YR 6/6), BEDDING NOT APPARENT, HIGHLY WEATHERED
	27.5 to 31.8		X						X	NO SAMPLE

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

Box 3 40 - 150

LOG OF BORING NO. 10-87 BR

DATES DRILLED
ELEVATION
GEOLOGIST(S): DCB/GCE
DATE 7/24/89
CHECKED BY: DATE

USCS SYMBOL

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (interval)	SAMPLE NUMBER	FEET OF CORE IN BOX (interval)	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	to cont'd.							31.0		NO SAMPLE (cont'd)
34.5	31.0 to 32.9		ND							AS ABOVE, WITH LOCAL OCCURENCES OF CLAYSTONE AND SANDSTONE, POSSIBLE BIOTURBATION (?), INTERVAL AT 33.8 GRADES INTO SANDSTONE, GRAYISH ORANGE (10YR 7/4), NO BEDDING APPARENT, HIGHLY WEATHERED, HIGHLY FRIABLE FINE GRAINED TO V. FINE GRAIN, MODERATELY WELL SORTED, SUBROUNDED TO ROUNDED,
3/4 Bottom of Box	32.9 to 34.5		ND					33.0		
Top of 4/4	34.5 to 36.2		ND					35.0		BOTTOM OF BOX ↑ SILTY SANDSTONE, GREYISH ORANGE (10YR 7/4), MOTTLED TO A (VERY LIGHT GREY N8), BEDDING NOT APPARENT HIGHLY WEATHERED, MODERATELY FRIABLE, SOME CLAY.
	36.2 to 38.1		ND					36.0		↑ AS ABOVE
	38.1 to 40.1		1.95					38		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO.

10-87 BOR 2

DATES DRILLED
ELEVATION
GEOLOGIST(S): DCB/GCE
DATE 7/27/89
CHECKED BY: DATE:

USCS symbol

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FOOT (INTERVAL)	SAMPLE NUMBER	FEET OF CORE RECOVERED (INTERVAL)	~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	40.1 to 42.1		NO SAMPLE	1				41.0		NO SAMPLE
	42.1 to 44.1		1.6'				CLAY >50%	42.0		CLAYSTONE, MED DARK GREY (N4), NO BEDDING IS APPARENT, HIGHLY WEATHERED, MODERATELY FRIABLE, POSSIBLE INTRACLASTS, LOCALIZED IRON STAINING, SOME CARBONACEOUS MINERALIZATION, SHALY PARTINGS, POSSIBLE PLANT REMAINS
	44.1 to 50.6		NO SAMPLE					44.0		NO SAMPLE

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

β γ Box 4 50-150 cpm

LOG OF BORING NO.

10-87 BR ?

DATES DRILLED:
ELEVATION
GEOLOGIST(S): DCB/GCE
DATE 7/24/89
CHECKED BY: DATE:

USCS SYMBOL

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (interval)	SAMPLE NUMBER	FEET OF CORE IN BOX (interval)	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	Cont'd to 50.6									
(5.3) Bottom of box 4/4	50.6 to 53.0		1.6'					51.0		AS ABOVE
								53		BOTTOM OF BOX

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 10-27

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): FCB
DATE: 7/22/87
CHECKED BY: DATE:

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (IN FEET)	SAMPLE NUMBER	FEET OF CORE IN BOX	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0 0	0 0 to 0 1		ND	OL				>40' silt			Gravelly Silt, pale yellowish brown (0 YR 6/2), abundant plant roots, silt is calcareous
	0 4 to 4 5		0						1, 2, 3, 4		No Sample
	4 5 to 5 45		(1) .7	CL					5		Silty, Gravelly Clay, dark yellowish brown, (10 YR 4/2), moderate plasticity, calcareous, some sand.
	5 45 to 6 5		0						6		No Sample
	6.5 to 7.45		ND	CL					7		As above (reference interval 4.5 to 5'45).
	7 45 to 8 5		0						8		No Sample
	8 5 to 10 5		(1) 1.3	CL					9		Silty Clay, mottled moderate brown (5 YR 3/4), yellowish gray (5 Y 8/1) and moderate yellowish brown (10 YR 5/4), low plasticity, some gravel, trace of sand, ~~[illegible]~~ carbonate mineralization

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 10-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 7/28/89
CHECKED BY:
DATE:

USCS symbol

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW	SAMPLE NUMBER	FEET OF CORE IN BOX	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	8.5 to 10.5		(1) 1.3	CL			>50' Clay			occurs locally.
	10.5 to 11.0		ND					11		Clay, very light gray (N8), high plasticity, localized iron staining, trace of gravel and silt
	11.0 to 12.5		0					12		
	12.5 to 12.95		.3 (1)	CL			>50' Clay			As above (reference interval 10.5 to 11.0)
Box 1 of 3	12.95 to 14.5		0					13, 14		
	14.5 to 14.9		3 (1)				>50' Clay	15		As above (reference interval 10.5 to 11.0)
16.6	14.9 to 16.6		(1) 1.7	CL				16		
16.6	16.6 to 18.1		ND		Erasures 7/28/89 DCB			17, 18		As above with color change to moderate brown (5 YR 4/4) at 17.5 ft (est depth), two sandstone cobbles occur at this depth
Box 2 of 3	18.1 to 19.6	Previously sampled this interval	.6					19		Clay, moderate brown (5 YR 4/4), grades to pale yellowish brown (10 YR 6/2), high plasticity, trace of gravel which is absent below the color change at 18.4 ft. (est depth), localized carbonate mineralization
	19.6 to 21.4		ND							

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 10-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 7/23/89
CHECKED BY:
DATE:

USCS symbol

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX	~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	19.6 to 21.4		ND	CL				750' clay	21		As above
	21.4 to 22.2		ND					750' clay	22		Claystone, pale yellowish brown (10 YR 6/2), bedding not apparent, highly weathered, moderately friable, laminar zone of carbonate mineralization at 21.7 ft (est depth) and a laminar zone of Fe/Mg oxide mineralization at 21.9 ft. (est depth), ~~both~~ DCB laminae inclined at 10° and 40° respectively
	22.2 to 23.0		ND						23		
24.55	23.0 to 24.55		ND						24		
									25		
									26		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 11 87

GEOLOGIST(S): NDY
DATE: 8/14/87

PROJECT NO: 6667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0-0.25	ND								1 LARGE COBBLE, 7.5 cm, ANGULAR
	0.25 -2.15	(1) 1.7					GC	1, 2		Top 1 FT OF INTERVAL. CLAYEY GRAVELY SAND, Dark yellowish brown (10 YR 4/2), angular - sub ~~angular~~ rounded, mod graded, max amp = 5 cm, some asphalt in top 3 in, some non staining as mottles. Bottom 0.7 FT OF INTERVAL: GRAVELY CLAYEY SAND pale yellowish brown (10 YR 6/2), angular - subangular, mod - poor graded, max amp = 2.5 cm, slightly calcareous w/ some calcite, some non staining as mottles
	2.15 -2.75	ND					GC			SAME AS ABOVE
	2.75 -4.45	ND ~~1.7~~					CL/CH	3, 4		CLAY, Yellowish gray (~~5Y~~ 5Y 8/1), mod - high plast, slightly calcareous w/ ~~abundant~~ calcite nodules, non staining as ~~mottles~~ mottles & as thin laminae, some silt, trace of gravel, trace of dark yellowish brown Sandy Clay, max gravel amp = 1.5 cm. Color Eraser NDY
	4.45 -5.75	ND					CL/CH	5		Same as above
Box 1 of 3	5.75 5.95	ND								Same as above
	5.95 -7.55	ND					CL/CH	6, 7		Same as above. & pinkish gray (5 YR 8/1), Slightly calcareous, some calcite, max gravel amp = 5 cm
↑ 7.55										
7.55 ↓	7.55 -8.7	(1) 1.0					CL/CH ~~CG~~ GC	8		TOP 8 IN SAME as above. Bottom 4 in CLAYEY GRAVEL, GRAVEL NDY brownish gray (5 YR 4/1) angular - subangular, mod - poorly graded, max amp = 6 cm, some silt, some sand
Box 2 of 3	8.7 -9.1	~~1.0~~						9		NO SAMPLE
	9.1 -10.7	~~ND~~ 0.1 ft ~~Pebbles~~					GC			(Very small sample) Same as above

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO

LOG OF BORING NO. BH 1187

GEOLOGIST(S): [illegible]
DATE: 8/14/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
										See previous page
Box 2 of 3	10.7 -12.3	ND					CL	11		Clay, very pale orange (10 YR 8/2) and yellowish gray (5 Y 8/1), mod plast, trace of silt, top 3 IN has calcite ~~[illegible]~~ modules, other is very slightly calc, some iron staining as mottles esp. in bottom 4 IN, ~~trace of silt~~
	12.3 -13.9	(1) 1.8					CL	12		Same as above: no calcite, non-calc., iron staining as mottles throughout interval
	13.9 -15.2	TOO SMALL TO MEASURE					CL	13		(very small sample) Same as above
15.2								14		
15.2 ↓	15.2 -16.6	(1) 1.6					CL	15		Same as above, abundant iron staining in top 6 IN
	16.6 -16.9	ND					CL	16		Same as above: iron staining as mottles
Box 3 of 3	16.9 -19.4	ND					CL	17		Same as above: some iron mineralization, moderate brown (5 YR 3/4)
↑ 19.4								18		
								19		
END OF BOXES										

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 11-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): UAA
DATE:
CHECKED BY:
DATE: 7/27/89
PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (interval)	SAMPLE NUMBER	FEET OF CORE (INCHES)	USCS SYMBOL	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 to 1.7		.6 (2)	CL						1		Silty clay Brownish gray to olive gray (5yr 4/1) to (5y 4/1). Moderate plasticity Trace sand Trace gravel. Surficial roots + grass present
			0							2		No Sample
	2.0 to 4.0	SL	1.4 (1)						Clay <30%	3		~~Clays~~ UAA Siltstone. Very pale orange (10yr 8/2) to grayish orange (10yr 7/4). Some clay. Weathered, slightly to moderately friable Some roots Trace iron staining Trace $CaCO_3$ Trace iron staining
Box 1 of 1	4.0 to 6.0		1.8 (1)							4, 5		Same as above w/ lenses of very fine grained sands more $CaCO_3$, some $CaCO_3$ mineralization in vertical fractures.
	6.0 to 7.9	SL	1.0 (1)							6, 7		Same as above
7.9	7.9									8		Bottom of Boxes

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

Bγ Bkg: 50-100 cpm
Bγ Box: 50-150 cpm

LOG OF BORING NO. 11-87 A

PAGE 1 OF 1

GEOLOGIST(S): DCB
DATE: 8/16/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0 0	ND				>50% clay	CL			Clay, dark yellowish brown (10 YR 4/2), moderate plasticity, some roots and silt.
						>50% clay	GC			Gravel, very light gray (N8), angular, poorly graded, 3 cm. max size, some clay and silt, trace of sand.
						>50% Gravel	CL	1		Clay, light gray (N7), moderately high plasticity, localized iron staining, some silt, caliche body at ~1.8 ft.
	1 93									
	1 93 to 3.0	0						2		No Sample
Box 1 of 1	3.0 to 5.0	ND				>50% clay	CL	3 4 5		Claystone, light gray (N7), bedding not apparent, highly weathered, slightly friable, iron staining as mottling and on fracture faces.
	5.0 to 7.7	ND						6 7		
↑ 7.7	7.7							8		Bottom of Box 1 of 1 at 7.7 ft.

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

/

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 11-87 BTR

GEOLOGIST(S): [illegible]
DATE: 8/25/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 -2.0	(1) 1.9				100% CLAY	CL	1		CLAY, top is dusky yellowish brown (10 YR 2/2), bottom yellowish brown (10 YR 4/2), mod plast, some sand, (FG-MG), some gravel (max size = 3 cm), ~~abundant~~ some roots.
	2.0 -4.0	(1) 2.3				20% SAND 80% CLAY	CL	2, 3		SANDY CLAY, grayish orange (10 YR 7/4), mod-high plast some gravel (max size = 5 cm), trace of roots, slightly calc w/ trace of calcite
Box 1 of 4	4.0 -5.2	(1) 1.0				20% SAND 80% CLAY	CL	4, 5		Same as above, dark yellowish orange (10 YR 6/6), max gravel size = 7 cm, sand is VFG-FG
	5.2 -7.0	(1) 2.7				100% CLAY	CL	6		CLAY, yellowish gray (5 Y 8/1), est. mod plast, iron staining as mottles and in fractures, ~~trace of sand material~~ trace of Mg staining, ~~blocky texture~~ highly micro fractured, trace of sand
↑ 8.3	7.0-8.3	(1) 1.1				100% CLAY	CL	7, 8		Same as above. trace of iron staining
8.3 ↓	8.3 -10.0	(1) ~~1.1~~ 2.0				100% CLAY	CL	9		Same as above. increased sand (VFG) at base of interval

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 11-87 ER

GEOLOGIST(S): DAJ
DATE: 8/25/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 4	10.0 -12.0	(1) 2.7				20 30% SILT 80 70% CLAY; 20 30% SILT 70% ~~CLAY~~ 50 SAND 30% CLAY		11		Top 1.4 FT SILTY CLAYSTONE (possibly SILTY CLAY), non-apparent bedding, well weathered, mod-poorly friable, flowy texture, some iron staining along possible fracture joint planes, Mg staining. Bottom of same interval: SILTY CLAYEY SANDSTONE, bedding is non-apparent, highly weathered, mod friable, VFG-FG, mod sorty, ~~some~~ clay, ~~[illegible]~~ @ base of interval, some iron staining, trace Mg stain.
	12.0 -14.5	(1) 2.8				20 ~~30%~~ SILT 50 ~~70%~~ SAND 30% CLAY		12, 13, 14		Same as above: increased clay fraction from @ 13.0 - 13.5 FT, trace of carb material
↑ 15.2	14.5 -15.2	(1) 0.6				60% SAND 20% SILT 20% CLAY		15		Same as above: increased sand fraction at base of interval
15.2	15.2 17.0	(2) 2.1				60% SAND 20% SILT 20% CLAY		16		Same as above: decreasing sand fraction at base of interval. SLAB shows massive bedding w/ small horizontal clay lenses (@ 1-3 mm thick, 1-4 cm long), some Mg dendritic staining and massive clay bed at base of slab
Box 3 of 4	17.0-20.0	(2) 3.2						17, 18, 19		Same as above

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 11-87 BB

GEOLOGIST(S): [illegible]
DATE: 8/25/87

PROJECT NO: 667-11 Z2

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 3 of 4	20.0 -~~21.0~~ 21.1	(1) 0.9	DAT #3					21		SILTY VFG SANDSTONE, moderate yellowish brown (10 YR 5/4), non-apparent bedding (unconsolidated), highly weathered, highly friable, angular-subangular, mod. sorted, some clay
	21.1 -24.0	(2) ~~2.65~~ 2.75						22 23		Top 6 IN - Same as above Bottom of interval: ~~Stony~~ VFG SANDY CLAYSTONE, very light gray (N8) grad to mod light gray (N7), non-apparent bedding, highly weathered, mod friable, abundant iron staining as mottles, some carb material, some silt, lens @ 23.0 FT - 23.5 FT
24.0 ↑										
24.0 ↓ Box 4 of 4	24.0 -25.0	(2) 1.75						24		SILTY CLAYSTONE, mod light gray (N6), non-apparent bedding, highly weathered, mod friable, abundant iron staining in mottles and in ≈90° fractures, some sand as lenses in top 1 FT of interval and in matrix in bottom of interval
	25.0 -27.0	(2) 2.6						25 26		Top 1 FT - Same as above Bottom 1 FT - CLAYSTONE, mod dark gray (N4), non-apparent bedding, highly weathered, mod friable, highly micro-fractured w/ iron staining filling fractures
	27.0 -30.0	(2) 3.7						27 28 29		Same as above: light olive gray (5Y 6/1) Some micro-fractures w/ iron staining filling fractures
30.0 ↑										

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

END OF BOREHOLE

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SP11-87

GEOLOGIST(S): LAA
DATE: 8/10/89

PROJECT NO: 6667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0 ↓	0.0 to 1.5	.6 (1)				Clay >75%	CL	1		Clay. Dusky yellow (5y 6/4). Slightly silty, trace sand Est plasticity mod to high. Surficial grass & root material present.
	1.5 to 3.5	1.1 (1)				Clay >50%	CL	2, 3		Silty clay. Yellowish gray (5y 8/1) to grayish orange (10yr 7/4) mottled Est plasticity slightly calcitic. Trace surficial root material.
	3.5 to 6.3	2.6 (1)				Clay >50%	CL	4, 5, 6		Same as above Some gravel Few lg pieces (to 8cm) Subrounded. Trace carb material. Very slightly calcareous
Box 1 of 3	6.3 to 8.8	2.5 (1)				Clay >50%	CL	7, 8		Sandy Gravelly Clay Yellowish gray to dk yellowish orange (10yr 6/6) Mottled Est plast. moderate Some Calcareous & carb. material Sand-v.f g to coarse Gravel to 4 cm
↑ 9.3	8.8 to 9.3					Clay >50%	CL	9		Same as above
9.3 ↓	9.3 to 9.5									See next page for description.

Begin Box 2 ↓

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SP-11-87

GEOLOGIST(S): LAA
DATE: 8/10/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 3	9.3 to 11.5	1.0(1)				Clay >50%	~~clay~~ CL	11		Silty clay ~~stone~~ lt. Dk yellowish brown. (10yr 4/2). ~~Highly weathered. Mod to highly friable.~~ mod plasticity Bedding not evident Some gravel to ≈ 2cm Some sand v.f.g. to coarse. Slightly calcitic Heterogeneous.
	11.5 – 14.0	2.6(1)				Clay >50%	CL	12, 13, 14		Same as above. Gravel fine to ≈ 3cm.
	14.0 – 16.5	.6(1)				Clay >50%	CL	15, 16		Same as above some Lg cobbles of gravel (≈5cm) Subangular
	16.5 – 19.0	.8(1)				Clay >50%	CL	17, 18, 19		Same as above.
	19.0	0								

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SP11-87

GEOLOGIST(S): LAA
DATE: 8/10/89
PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 3	21.5	0						21		
	24.0	21 (1)					Clay >50%	22, 23		Silty claystone Pale yellowish brown (10yr6/2) Highly weathered. Moderately friable Bedding not evident Some carbonaceous material present Some iron staining
	24.6	.65 (1)					Clay >50%	24		Same as above
	26.5	1.5 (1)					Clay >50%	25, 26		Silty Claystone Pale brown. (5yr 5/2) Highly weathered. Mod Friable Bedding not evident but has turbated appearance on slab — Begin Box 3
Box 3 of 3	29.0	1.5 (1)					Clay >50%	27, 28, 29		Same as above
	29.0 to 31.5									See next pg for description

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SP11-87

GEOLOGIST(S): UAA
DATE: 8/10/89

PROJECT NO: 6067-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	29.0	(1) 20				Clay >50%		31		Silty Claystone, Lt. Olive gray (5y 6/1) to grayish orange (10yr 7/4). Highly weathered, Mod friable. Pillowy bedding
	31.5									
		26 (1)				Clay >50%		32, 33		Same as above Trace iron staining Some carbonaceous material
	34.0							34		
								35, 36, 37, 38, 39		Bottom of Boxes

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 12-87

GEOLOGIST(S): DCB/GCE
DATE: 7-21-89
PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
TOP Box 1 (1/2)	0.0 TO 2.25	(1) 1.05				4-.2cm 50% Fines 50%	GP	1, 2		Gravel and Clay, medium gray (N5) - Gravel, grayish brown (5 YR 3/2) Angular to subrounded, poorly graded, abundant roots and plant remains. * Note: partial recovery 0.0 to 2.0 from abandoned bore hole is included in box.
	2.25 to 4.0	(1) 1.7				Clay >50%	OH	3, 4		Clay, moderate brown (5 YR 3/4), moderate plasticity, some gravel, silt and root fragments. Interval grades to claystone in upper 0.3 ft of interval. Claystone, light olive gray (5 Y 6/1), highly weathered, calcareous, some iron oxide staining, root fragments.
	4.0 to 7.0	(1) 0.85				Clay >50%		5, 6, 7		Same as above [0.3 FT], moderately friable.
Bottom of Box ↓9.2	7.0 to 9.2	(1) 1.9		<=45°		Clay >50% / Silt >50%		8, 9		Claystone, light olive gray (5 Y 6/1), highly weathered, moderately friable, iron staining occurs locally along long fractures. Gradational change to a siltstone at ~8.2 ft, yellowish gray (5 Y 7/2), weathered, moderately friable, iron staining occurs locally along long fractures.
TOP Box 2/2	9.2	(1) 3.3				Silt >50%				Siltstone, yellowish gray (5 Y 7/2) weathered, moderately friable, localized iron staining + carbonaceous mineralization (cont'd.)

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible.

This log has been recopied to include the correct graphic lithologic log. CKF

ROCKY FLATS PLANT

FIGURE NO.

B8 Background 50-100 cpm
Box 2 50-150 cpm

LOG OF BORING NO. BH 12-87

GEOLOGIST(S): DCB/GCE
DATE: 7/21/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	9.2 to 12.0 (Cont'd)	(Cont'd) 3.3 (1)						11		See above description
	12.0 to 17.0 (Bottom of Box)	5.1 (1)				>50% Clay		12, 13, 14, 15, 16		Claystone, med light Gray (N6), weathered, moderately friable. Localized staining and carbonaceous mineralization.
17.0 Bottom of Box								17		Bottom of Box

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 1287

DATES DRILLED:
ELEVATION
GEOLOGIST(S) DCB/GCE
DATE 7/21/89
CHECKED BY: DATE

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE (IN FEET)	SAMPLE NUMBER	FEET OF CORE IN BOX	USCS SYMBOL	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
TOP BOX 1 (1/2)	0.0 to 2.25		1.05' (1)	GP				GRAVEL 50% FINES 50%	1.0 2.0		GRAVEL AND CLAY, MEDIUM GREY (N5) - GRAVEL, GREYISH BROWN (5YR 3/2) ANGULAR TO SUBROUNDED, POORLY GRADED, ABUNDANT ROOTS AND PLANT REMAINS. * NOTE: PARTIAL RECOVERY 0.0 to 2.0 FROM ABANDONED BORE HOLE IS INCLUDED IN BOX.
	2.25 to 4.0		1.7' (1)	OH				CLAY >50%	3.0 4.0		CLAY, MODERATE BROWN (5YR 3/4), MODERATE PLASTICITY, SOME GRAVEL. SILT AND ROOT FRAGMENTS. Interval grades to CLAYSTONE IN UPPER .3 FT OF INTERVAL. CLAYSTONE, LIGHT OLIVE GRAY (5Y 6/1), HIGHLY WEATHERED, ~~CHALKY~~ CALCEREOUS, SOME IRON OXIDE STAINING, ROOT FRAGMENTS
	4.0 to 7.0		.85' (1)					CLAY >50%	7.0		(SAME AS ABOVE) [.3 ft], MODERATELY FRIABLE,
Bottom of Box ↓ 9.2	7.0 to 9.2		1.9' (1)			<.05°		CLAY >50% SILT >50%	9.0		CLAYSTONE, LIGHT OLIVE GRAY (5Y 6/1), HIGHLY WEATHERED, MODERATELY FRIABLE, IRON STAINING OCCURS LOCALLY ALONG LONG FRACTURES. GRADATIONAL CHANGE TO A SILT-STONE AT ~8.2 ft, YELLOWISH GREY (5Y 7/2), WEATHERED, MODERATELY FRIABLE, IRON STAINING OCCURS LOCALLY ALONG LONG FRACTURES.
TOP BOX 2/2	9.2		3.3' (1)					SILT >50%			SILTSTONE, YELLOWISH GREY (5Y 7/2), WEATHERED, MODERATELY FRIABLE, LOCALIZED IRON STAINING AND CARBONACEOUS MINERALIZATION (Cont'd)

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

pr BACKGROUND 50-100 cpm
BOX 2 50-150 cpm

LOG OF BORING NO.

BH 12 87

DATES DRILLED:
ELEVATION
GEOLOGIST(S) DCB/GCE
DATE 7/21/89
CHECKED BY: DATE:

USCS symbol

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (1/1 BOX)	SAMPLE NUMBER	FEET OF CORE IN BOX (1/1 BOX)	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	9.2 to 12.0 (cont'd)		(cont'd) 3.3' (1)							↑
	12.0 to 17.0 (Bottom of Box)		5.1' (1)				750 clay	12		CLAYSTONE, MED LIGHT GREY (N6), WEATHERED, MODERATELY FRIABLE. LOCALLIZED STAINING, AND CARBONACEOUS MINERALIZATION.
17.0 (Bottom of Box) ↓	↓							17.0		Bottom of Box

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

βγ (SEE PAGE 1)

LOG OF BORING NO. 12-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S) LAA
DATE
CHECKED BY.
DATE. 7/27/89
PROJECT NO. 667-11.22

USCS symbol

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (interval)	SAMPLE NUMBER	FEET OF CORE IN BOX (interval)	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 ↓ ↑ 0.8		0.8(2)	CL							Silty Clay Grayish brown (5yr 3/2). Moderate plasticity Some surficial roots and grass. Some sand + fine gravel. Trace $CaCO_3$
		0							1		No Sample
	2.0 ↓ ↑ 4.0		1.8(1)	CL					2, 3		As Above Less silt, roots + sand. Grades to Clay & yellowish ~~brown~~ LA gray (5y 8/1) last 5 in of interval. Moderately high plasticity Trace roots and iron staining.
	4.0 ↓ ↑ 5.85	SL	1.8(2)	ML				Clay 30-40%	4, 5		Clayey Silt. Very pale orange (10yr 8/2). Homogenous. Iron staining throughout matrix
Box 1 of 2	6.0 ↓ ↑ 7.9	SL	1.8(2)	ML					6, 7		As above. Trace Some carbonaceous material
↑ 10.0	8.0 ↓ ↑ 10.0	SL	1.8(2)	ML					8, 9		As above Grains ~~may~~ getting slightly larger. Almost very fine grained sand

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(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

βγ Box 1 → 50-100cpm

LOG OF BORING NO. 12-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:
DATE: 7/27/89

USCS symbol

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	FEET OF CORE IN ROW	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
100 ↓	100 to 119		1.9 (2)	CL ML				Silt 40-30%	11		Clayey silt and silty clay - Interbedded Approaching soil/bedrock contact (gradational) very light gray (N8) to med light gray (N6) to light olive gray (5y 6/1). Clay constituent - moderate plasticity. Some horizontal bedding evident. Heavily iron stained, weathered. Silt has some CaCO3
Box 2 of 2	120 to 139		1.75 (2)	CL					12, 13		Same as above, becoming ~~highly~~ weathered claystone Abundant iron staining in matrix and especially in horizontal + vertical fractures ~~Some~~ Trace carbonaceous material
↑ 159	140 to 159		1.85 (1)	CL					14, 15		Same as above
									16, 17, 18, 19		Bottom of Boxes

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

PO Box 2 50-100cpm.

LOG OF BORING NO. 12-87, BRA

PAGE 1 OF 1

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): [illegible]
DATE: 7/29/89
CHECKED BY:
DATE:

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	USCS SYMBOL FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 to 2.0		(1) .5	CL			>50%	1		Silty Clay, dark yellowish brown (10 YR 4/2), high plasticity, some gravel and plant detritus.
2.0 to 4.0	2.0 to 4.0		(1) .4				>50% clay	2, 3		Clay, medium light gray (N6) to yellowish gray (5 Y 8/1), trace of gravel, roots and silt, sample reacts weakly with dilute HCl
								4		Bottom of Box 1 of 1 at 4.0 ft
								5, 6, 7, 8, 9		

Box 1 of 1

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SP12-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY: DATE: 8/9/89

PROJECT NO: 667-11.22

Depth Scale	Depth Interval	Time	Recovery (%)	USCS Symbol	Penetrometer	Blows	Water Level	Lithologic Description	Sample No.	Sample Type	LITHOLOGIC DESCRIPTION
0.0	0.0 to 1.5		1.15(1)	CL				Clay >70% Silt >10%	1		Silty Clay, Grayish orange to dk yellowish orange (10yr 7/4 to 6/6) Mod to high plasticity Trace surficial root material Trace iron stain noted. Very slightly calcareous. Trace sm gravel
	1.5 to 3.5		2.15(1)	CL				Clay >70% Silt >10%	2, 3		Same as above
	3.5 to 6.5		3.0(1)	CL				Clay >50% Gravel ~20% Silt ~20%	4, 5, 6		Sandy ~~Silty~~ Gravelly clay Lt. brown (5yr 5/6). Est plast moderate Gravel angular to rounded poorly graded. Max size ≈ 4cm Sand vfg to granules Grades to silty clay at bottom of interval Lt. brownish gray. (5yr 6/1) to grayish orange (10yr 7/4). Slightly calcitic.
Box 1 of 5	6.5 to 8.3		1.85(1)	CL				Clay >50%	7, 8		Silty Clay ~~Stone~~ Lt. brownish gray (5y 6/1) to grayish orange (10yr 7/4). Slightly calcitic Est. plast. mod. to high.
8.3 ↑ 9.0	8.3 to 9.0		1.45(1)					Clay >50%	9		Same as above
	9.0 to 11.5		3.4(1)	CL				Clay >50%			Silty Clay Yellowish gray (5y 8/1) Lt. brown (5yr 5/6) and brownish gray (5yr 4/1) mottled Est. plasticity - moderate Locally sandy, gravelly to areas — Continued on next page

Begin New Box

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

Boxes Overlap 8.3 to 9.0

LOG OF BORING NO. SP 12-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): UAA
DATE:
CHECKED BY:
DATE: 8/10/89
PROJECT NO: 667-11.22

Depth	Sample	Feet of Core	USCS symbol	Fractures per Foot	Fracture Angle	Bedding Angle	Drill Size	Depth in Feet	Lithologic Log	Lithologic Description
Box 2 of 5	9.0 to 11.5		CL				Clay >50%	11		Continued from previous page... Gravel subrounded, poorly sorted to 3.5 cm. Sand v f g to granules. These areas only a few inches long. Still in very clayey matrix. Some $CaCO_3$
	11.5 to 14.0	3.3(1)	CL				Clay >50%	12, 13, 14		Same as above
Box 3 of 5	14.0 to 16.5	3.3(1)	CL				Clay >50%	15, 16		Clay yellowish gray (5y 7/2) to lt olive gray (5y 5/2) mottled to lt brown (5yr 5/6). Est. plasticity mod to high. Calcite throughout matrix and in stringers. Trace sand in lt brown areas. Begin Box 2
	16.5 to 19.0	2.55(1)	CL				Clay >50%	17, 18		Same as above. More $CaCO_3$ stringers. Becomes gravelly toward bottom of interval.
							Gravel ~5%	19		
	19.0	2.2(1)	CL				Clay >50%			Silty Clay. Dk. yellowish brown (10yr 4/2). Est plasticity - mod to high. Some sand, sub. Some gravel throughout matrix (~1.5 cm) rounded. Very slightly calcareous.

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(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SP 12-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:
DATE: 8/10/89

USCS symbol

PROJECT NO: 667-11.22

Depth (ft)	Depth (ft)	Sample Number	Feet of Core	Feet of Core	Fractures per Foot	Fracture Angle	Bedding Angle	Drilling Rate	Depth in Feet	Lithologic Log	LITHOLOGIC DESCRIPTION
21.5	21.5		2.2 (1)	CL				Clay >50%	21		See previous page for description of this interval.
	21.5 – 24.0		1.8 (1)	CL				Clay >50%	22, 23, 24		Clay. Dark yellowish brown. (10yr4/2). Est Plast mod to high Trace Fine to coarse sand Trace root material. Slightly silty
	24.0 – 26.5		0						24, 25, 26		No Sample
	26.5 – 29.0		1.6 (1)	CL				Clay >50%	27, 28, 29		Clay Lt olive gray (5y6/1). Est plast. mod. to high Some calcite Trace silt, sand
	29.0		1.3 (1)	CL				Clay >50%			Same as above Beginning to show some small stained fractures. Trace Carb material

Box 4 of 5

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SP 12-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): UAA
DATE:
CHECKED BY:

USCS symbol

DATE: 8/10/89

PROJECT NO: 667-11.22

Top/Bottom of Core in Box	Top/Bottom of Core in Box (Inches)	Sample Number	Feet of Core (Inches)	Feet of Core (Inches)	Fractures per Foot	Fractures Angle	Bedding Angle	Grain Size Distribution	Depth in Feet	Lithologic Log	LITHOLOGIC DESCRIPTION
	31.5		13(1)	CL				Clay >50%	31		See previous page for description.
	31.5								32		No sample
									33		
									34		
									35		
									36		
									37		
									38		
									39		
	39.5										
	39.5										See next page for description

Box 4 of 5

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SP12-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): CAA
DATE:
CHECKED BY:

USCS symbol

DATE: 8/10/89

PROJECT NO: 667-11.22

Depth in feet	Depth in feet	Sample number	Feet of core	Core size	Fractures per foot	Fracture angle	Bedding angle	Drill size	Depth in feet	Lithologic log	Lithologic description
Box 4 of 5			1.8(1)					Clay >50%	41		Silty claystone Pale brown (5yr 5/2). Possible horizontal bedding. Highly weathered Mod friable Some carb. material Some iron staining.
			1.75(1)					Clay >50%	42, 43		Same as above.
44.0	44.0								44		
Box 5 of 5	44.0		1.85(1)					Clay >75%	45, 46		Claystone. Lt olive gray (5y 6/1). Highly weathered Moderately friable Bedding not evident Slightly silty ~~Some~~ Trace wt. iron staining.
46.5	46.5								47, 48, 49		Bottom of Boxes.

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 13-87

GEOLOGIST(S): DCB
DATE: 8/22/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 to 2.0	ND				>50' clay	CL	1, 2		Silty Clay, moderate brown (5YR 3/4), moderate plasticity, some gravel in upper .5 ft., some roots.
	2.0 to 3.6	ND						3		Calcareous minerals present at ~2.5 and below
Box 1 of 3	3.6 to 4.85					~50' Gravel ~50' clay	GC CL	4		Interval grades to Gravelly Clay. Gravelly Clay, dominantly medium light gray (N7) matrix is light brown (5YR 5/6), subangular, poorly graded, max size 6.5 cm, caliche found on gravel, clay has moderate plasticity and caliche precipitate.
	4.85 to 6.55							5, 6		
	6.55 to 7.2					>50% clay size		7		Caliche, white (N9), some clay and gravel, caliche and clay exhibit banded appearance at ~6.9 ft.
7.6	7.2 to 7.6									
7.6	7.6 to 8.95	ND						8		
Box 2 of 3	8.95 to 10.1	(1) .5						9		

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 13-87

GEOLOGIST(S): DCB
DATE: 8/22/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	8.95-10.1	.5 (1)								
Box 2 of 3	10.1 to 10.55	0								No Sample
	10.55 to 12.1	(1) .9						11		Caliche as above (reference interval 6.55 to 10.1 ft.) with two cobbles at ~10.55 ft
	12.1 to 13.7	ND						12, 13		Clay, yellowish gray (5Y 7/2), moderate high plasticity, occasional caliche precipitate and iron staining, trace of silt
	13.7 to 14.7	ND						14		Increase in silt fraction at ~14.6 ft with color change to grayish orange (10YR 7/4).
15.2	14.7 to 15.2	(1) <.1						15		
15.2 Box 3 of 3	15.2 to 16.85	(1) .6						16		Irregular body of caliche at ~16.7 ft. ~1.5cm DCB x .5cm.
17.3	16.85 to 17.3	ND						17		color change to light gray (N7) at ~17 ft.
								18		Bottom of Box 3 of 3 at 17.0 ft.
								19		

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 13-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:

USCS symbol

DATE: 8/8/89

PROJECT NO: 667-11.22

Top/Bottom of Core in Box	Top/Bottom of Core (Depth)	Sample Number	Feet of Core	Feet of Core	Fractures per Foot	Fracture Angle	Bedding Angle	Grain Size Distribution	Depth in Feet	Lithologic Log	Lithologic Description
Box 1 of 5	2.0		95(1)	GC				Gravel >50%	1		Clayey gravel Gravel predom. med. Lt. gray (N6.) Angular to subrounded. Mod. well graded Max. size 5.5 cm. Matrix dk yellowish brown (10yr 4/2) Silty clay, grading to sandy clay (mod yellowish brown 10yr 5/4) at bottom of interval Sand very f.g. Est. plast. mod Some grass + root material at sum
	2.0 4.0		1.7(1)	CL				Clay >50%	2 3		Silty calcareous clay. Dk yellowish brown (10yr 4/2) consistency of flour. Grades to more ~~solid~~ lt cohesive grayish orange (10yr 7/4), with thin CaCO3 layers some horizontal bedding visible.
	4.0 6.0		2.0(1)					Clay >50%	4 5		Silty claystone Very pale orange (10yr 8/2) to dk yellowish orange 10yr 6/6 Highly weathered. Slightly friable. Calcite stringers and iron staining
	6.0 8.5		2.75(1)					Clay >50%	6 7 8		Same as above
	8.5 to 10.5		.6(1)					Clay >50%	9		Silty Claystone Very pale orange (10yr 8/2) Highly weathered, mod friable No bedding evident Calcareous.

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 13-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): UAA
DATE:
CHECKED BY:

USCS symbol

DATE: 8/8/89

PROJECT NO: 667-11.22

Top/Bottom of Core in Box	Top/Bottom of Core in Box (in feet)	Sample Number	Feet of Core (Inches)	Feet of Core	Fractures per Foot	Fracture Angle	Bedding Angle	Drill Size Distribution	Depth in Feet	Lithologic Log	Lithologic Description	
	10.5										See description on previous page	
↑ 11.5	10.5 / 11.5		8(1)					clay >50%	11		Silty claystone, Grayish orange to dk yellowish orange (10yr 7/4 to 6/6) Bedding not apparent Highly weathered, slightly friable moderately calcitic	
Box 2 of 5	14.5		26(1) ~~19~~					clay >50%	12, 13, 14		Same as above Some iron staining in fractures. Very slightly calcitic	Nel Box
	16.5		34(1)					clay >50%	15, 16		Same as above	
	18.5		22(1)					clay >50%	17, 18		Same as above	
↑ 18.9	18.9		.4(1)					Sand >50%			VFG silty sandstone Very pale orange to dk yellowish orange (10yr 8/2 to 6/6) Bedding not apparent trace clay	
18.9 ↓	18.9 to 21.5		~~1.85~~(1) 2.8						19		Same as above Clay content increases toward bottom till it becomes silty claystone @ ≈ 1.25 ft into interval (continued on next pg	New Box

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

Numbered wrong, had to erase #5 in depth in feet column

LOG OF BORING NO. 13-87BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:
DATE: 8/8/89

PROJECT NO: 667-11.22

Depth Scale	Depth Scale	Sample Number	Recovery (%)	USCS Symbol	Fracture Spacing	Fracture Angle	Fracture Type	Sample Type	Blows per 6 in	Graphic Log	LITHOLOGIC DESCRIPTION
		LAA #2									Continued from previous page. Grades back to fg grained sandstone at ≈ 1.65' down interval. Becomes clean siltstone @ bottom
	21.5								21		
	21.5		2.9(1)					Silt >50%	22		Clayey siltstone Pinkish gray (5yr 8/1). To dk yellowish orange (10yr 6/6) Bedding not apparent. Highly weathered, mod friable to highly friable. Fe/Iron stained fractures. Becomes sandy (med grained)
									23		
Box 3 of 5	23.5										
	23.5		3.2(1)					Silt 40% Clay 75%	24		Silty claystone lt brownish gray (5yr 6/1) to dark yellowish orange (10yr 6/6) Bedding not evident. Highly weathered, mod friable. Some iron staining. Some vertical fractures
									25		
									26		
	26.5										
26.9	26.5		.35(1)					Silt 40% Clay 75%			Same as above.
26.9	26.9								27		Silty claystone Very pale orange (10yr 8/2), to Dk yellowish orange (10yr 6/6.) Highly weathered, mod friable. Some iron staining on fractures. Bedding not apparent. Begin New Box
			1.9(1)					Clay 75%	28		
	28.5										
Box 4 of 5	28.5		~~1.8~~(1) 3.9(1)					Clay ~~50~~%	29		Same as above. Possibly horizontal bedding.

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 13-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S):
DATE:
CHECKED BY:
DATE:

USCS symbol

PROJECT NO: 667-11.22

Top/bottom of core in box	Top/bottom of core in box (in feet)	Sample number	Feet of core (in feet)	Feet of core (in feet)	Fractures per foot	Fracture angle	Bedding angle	Drill size (bit)	Depth in feet	Lithologic log	Lithologic description
									31		See above page for description.
Box 4 of 5	31.5 / 31.5		3.5 (1)					Clay >50%	32, 33, 34		Silty claystone. Dk yellowish orange (10yr 6/6) Highly weathered mod to highly friable. Bedding not apparent. Becomes grayish brown (5yr 3/2.) Some areas of heavy carbon, - coal like pockets
35.0	35.0								35		
	36.5		1.85 (1)					Clay >50%	36		Silty claystone Brownish gray (5yr 4/1) to Dk. yellowish orange (10yr 6/6) Highly weathered mod friable, Some iron stained cracks — Begin New Box
	38.5		2.85 (1)					Clay >50%	37, 38		Same as above. Color change at bottom of interval to Lt. brownish gray (5yr 6/1).
	38.5		1.0 (1)					Clay >50%	39		Same as above Extremely crumbly - crumbled Color change to dk yellowish orange at bottom of interval

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 13-87..BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:

USCS symbol

DATE: 8/8/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROCK	SAMPLE NUMBER	FEET OF CORE IN BOX	FEET OF CORE IN ROCK	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
									41		See previous page for description
41.5	41.5								42		Bottom of Boxes

Bottom of Boxes

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SP 13-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): UAA
DATE:
CHECKED BY:

USCS SYMBOL

DATE: 8/8/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN BOX (FT. BELOW)	SAMPLE NUMBER	FEET OF CORE	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 to 1.5		.35	CL				Clay >90%	1		Clay. Dark yellowish brown (10yr 4/2). Est plast. mod. to high Some silt Some sm. gravel. Subrounded Max size ≈ 2cm Some surficial grass + roots.
	1.5 to 3.5		1.0	CL				Clay >90%	2, 3		Clay Lt. brownish gray (5yr 6/1). Est plast. mod to high Trace iron staining.
Box 1 of 2	3.5 to 6.5		1.7	CL				Clay >90%	4, 5, 6		Same as above slightly more iron staining. Some carb. material
	6.5 to 9.0		1.2	CL				Clay >70% Silt >10%	7, 8, 9		Silty clay Pinkish gray (5yr 3/1) to dk yellowish orange (10yr 6/6.) Trace iron staining
	9.0 to 11.5		1.9	CL				Clay >70% Silt >10%			Same as above, not as much dk. Yellowish orange coloring Trace carb. material

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SP-13-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): GAA
DATE:
CHECKED BY:

USCS symbol

DATE: 8/8/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION	
Box 1 of 2	9.0 to 11.5			CL					11		See previous page for discription.	
	11.5 to 14.0		1.7(1)	~~CL~~ LA				Clay >70% Clay >90%	12, 13		Silty claystone Lt brownish gray (5yr 6/1) to dk. yellowish orange (10yr 6/6) No bedding evident Highly weathered. Slightly to mod. Friable. Becoming less silty and brownish gray toward bottom (5yr 6/1)	
14.0 Box 2 of 2	14.0 to 16.5		2.9(1)					Clay >90%	14, 15, 16		Claystone Lt brownish gray (5yr 6/1). Bedding not evident. Highly weathered. Mod. to highly weathered Trace carb material Trace iron staining Trace $CaCO_3$.	Begin New Box
									17, 18, 19			

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 14-87 BR

~~DATES DRILLED~~
~~ELEVATION~~
GEOLOGIST(S) DCB
DATE 7/20/89
CHECKED BY DATE

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (interval)	SAMPLE NUMBER	FEET OF CORE IN BOX (interval)	USCS SYMBOL ~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0 to 1.8		(1) 1.8	OL CL				>50% Clay	1		Silty Clay, dusky yellowish brown (10 YR 2/2), moderate plasticity, some gravel and organic detritus. At ~1 ft. this interval grades to a silty clay, moderate yellowish brown (10 YR 5/4), moderate plasticity, some fine sand and carbonate mineralization is disseminated throughout
	1.8 to 2.0		0						2		No Sample
DCB 4	2.0 to 4.0		(1) 1.8	CL					3		As above ~~from~~ (reference) interval below 1 ft., carbonate mineralization occurs in laminar stringers 1mm and less in thickness and as isolated bodies.
Box 1 of 4	4.0 to 5.2		(1) .7	CL					4 5		As above ~~not~~ DCB Note: a badly broken .3 ft. interval labeled 4' shoe occurs above interval marked 4.0' to 5.2'. *
	5.7 to 7.0		(1) 2.45	CL					6 7		As above, clay is mottled moderate yellowish brown (10 YR 5/4) to dark yellowish orange (10 YR 6/6), with an increase in carbonate mineralization
↑ 9.0	7.0 to 9.0		(1) 1.75	CL					8 9		As above ~~Note~~ DCB
8.0 ↓ Box 2 of 4											Note: An interval of 1 ft (as above) occurs at the top of this box and is labeled 8.0 to 9.0. See next page for 9' to 12' description

NOTES General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 14-87

PAGE / OF

GEOLOGIST(S): DCB
DATE: 8/21/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓ Bot 1 of 2	0.0 to 2.0	(1) 1.3				>50% Gravel	GC	1		Clayey Gravel, med. light gray (N6), clay matrix is brownish gray (5 YR 4/1), subangular, poorly graded, max size 6.5 cm, some roots, plant debris and silt.
	2.0 to 4.0	(1) .9				>50% clay	CL	2, 3		Clay, grayish brown (5 YR 3/2), moderately high plasticity (est), trace of roots and gravel
	4.0 to 7.0	(1) 1.0				>50% Gravel	GC	4, 5, 6		Sandy Clayey Gravel, dominantly light gray (N7), matrix is light brown (5 YR 6/4), angular to subangular moderately to poorly graded, max size is 5 cm.
	7.0 to 12.0	(1) .8				>50% clay	CL	7, 8, 9		Clay, yellowish gray (5 Y 7/2), high plasticity (est), some iron staining, trace of silt, body of caliche ~1 cm in diameter at ~7.1 ft.

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH DCB 14-87

PAGE 2 OF

GEOLOGIST(S): DCB
DATE: 8/21/89 +22

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 2 8/21/89	7.0 to 12.0	(1) .8				>50% clay	CL	10, 11, 12		Clay as above, caliche is absent.
12.8	12.0 to 12.8	(1) .5								
12.8 Box 2 of 2 8/22/89								13, 14, 15, 16, 17		Clay, mottled dark yellowish orange (10 YR 6/6) to very light gray (N7), moderately high plasticity, some silt, local iron staining, lighter grades to light gray (N7) with depth, trace of gravel at ~16.8 ft.
17.0										Bottom of Box 2 of 2 at 17.0 ft.
								18		

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
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(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SP 14-87

PAGE 1 OF 1

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): GCE
DATE: 8/1/89
CHECKED BY:
DATE:

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 TOP OF BOX	0.0 to 2.0		.2 ft						1.0		GRAVEL, VERY PALE ORANGE (10YR-8/2), ROUNDED TO SUBROUNDED, WELL GRADED, MAX CLAST SIZE 6 cm Ø.
	2.0 to 7.0		3.7 ft						2.0, 3.0, 4.0, 5.0, 6.0		UPPER .3 FT OF INTERVAL AS ABOVE. INTERVAL 2.0 to 3.0 ft IS CLAY, LIGHT OLIVE GRAY (5Y 6/1) MODERATE PLASTICITY, INTERVAL 3.0 to 7.0 ft IS CLAY, BROWNISH GRAY (5 YR 4/1), MODERATE PLASTICITY, SOME CALICHE CONCENTRATIONS PALE YELLOWISH ORANGE (10 YR 8/6)
bottom of BOX* 7.0									7.0		Bottom of Box. NOTE: * INTERVAL BLOCKS ARE POORLY LABELED IN THIS BOX. INTERVAL DEPTHS ARE BEST ESTIMATES. PROBLEM ARISES WHERE INTERVAL OVERLAP OCCURS (ie 2.0 to 4.0, 3.0 to 7.0 AS NEXT) SOLUTION: GROUP INTO 2.0 TO 7.0 — IGNORE DIVIDING BLOCK

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 15-87/BH30

GEOLOGIST(S): DCB/GCE
DATE: 7/19/89
PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	0.0 TO 1.1	(1) 0.95				60 0-20cm =45% VCG-FG =30% Fines =25%	GP	1		Gravel, black (N1) to white (N9) subangular to rounded, poorly graded, some sand and silt, plant detritus at top of interval, at 0.65' change to clayey gravel, very light gray (N8) angular poorly graded, some silt, clay fraction (5YR 3/2)
	1.1 TO 2.0	0								No Sample
	2.0-2.15	0.15 (1)						2		As above - lower portion of interval
Box 1/3	2.15 to 3.4	(1) 1.25				5-5cm to 2mm 45% VCG to FG 30% Fines 25%	GP	3		Gravel in caliche matrix, light gray (N7), angular poorly graded caliche matrix is very pale orange (10 YR 8/2)
	3.4 to 4.0							4		No Sample
	4.0 to 5.2	(1) 1.2				same as above	GP	5		As above - interval 2.15 to 3.4 with increase in max. gravel size to 7cm.
	5.2 to 7.0					7.0-20cm 65% VCG-FG 25% Fines 10%		6		No Sample
	7.0 to 8.15	(1) 1.15					GP	7		Sandy gravel, medium light gray (N6) angular to subangular, poor to moderate grading, some clay.
	8.15 to 9.0							8		No Sample
	9.0-9.2							9		No sample
10.35 (PAGE 2)	9.2 to 10.35	(1) 0.6				40-40 100%	GP			Gravel, med gray (N5) subangular to subrounded, poorly graded.

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

This log has been re-copied to include correct graphic lithologic log CKF

ROCKY FLATS PLANT

FIGURE NO.

BX Background 150-200
Box 1 50-200 cpm

LOG OF BORING NO. 1587/BH30 PAGE 2 OF 3

GEOLOGIST(S): DCB/GCE
DATE: 7/17/89

PROJECT NO: 6677-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1/3	9.7 to 10.35 cont'd	cont'd								(see page 1)
BOX 2/3	10.35 to 11.5	0						11		No Sample
	11.5 to 12.7	(1) 0.85				60-20m 50% VCG-FG 30% FVFCS 10%	GW	12		Sandy Gravel, medium light gray (N6) Subangular to subrounded, well graded, trace of silt.
	12.7 to 14.0	0						13		No Sample
	14.0 to 14.7	(1) 0.4				65-20m 90% VCG-FG 10%	GP	14		Gravel, light gray (N7), angular to subrounded, moderately graded, trace of sand + silt.
	14.7 to 16.0	0						15		No Sample
	16.0 to 17.15	(1) 0.85				Same	GP	16 17		(Same as above) Reference interval 14.0 to 14.7.
	17.15 to 20.0	0						18 19		No Sample

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

This log has been re-copied to include lithologic log CKF

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 15-87/BH30

GEOLOGIST(S): DCB/GCE
DATE: 7/19/89 - 7/20/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2/3 (cont'd)	20.0 to 21.5	(1) 0.85				4.0 to 2 70% VCG-FG 28% FINES 2%	GW	21		Sandy Gravel, medium gray (N5), subangular to subrounded, well-graded. Trace of Silt.
	21.5 to 22.5	(1) 1.2				same as above	CL	22		upper 0.35 ft (as above), interval changes gradational to a Silty Clay, very light gray (N8), moderate plasticity, trace of fine sand
Box Bottom 24.7	22.5 to 24.7	(1) 1.4				same as above	CL	23 24		As above, mottled coloring pale yellowish orange (10 YR 8/6), and very light gray (N8).
7/19/89 24.5 Box 3/3 Box Bottom 27.05	24.5 to 27.05	(1) 1.65					CL	25 26 27		As above.
								28 29		Bottom of boxes 1-3

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

This log has been copied to include lithologic log. CKF

ROCKY FLATS PLANT

FIGURE NO.

B & Data (1,2) see pgs. 1, 2
B & Background 150-200 cpm
Box 3 50-100 cpm

LOG OF BORING NO. 15-87/BH 30

DATES DRILLED
ELEVATION
GEOLOGIST(S) DCB/GCE
DATE 7/9/89
CHECKED BY DATE

PROJECT NO 6667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FOOT INTERVAL	SAMPLE NUMBER	FEET OF CORE IN BOX, INTERVAL	FEET OF CORE IN RUN (USCS SYMBOL)	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	0.0 to 1.1		.95' (1)	GP			60-200 45% VCG-FG 30% FINES 25%	1.0		GRAVEL, BLACK (N1) TO WHITE (N9) SUBANGULAR TO ROUNDED, POORLY GRADED, SOME SAND AND SILT, PLANT DETRITUS AT TOP OF INTERVAL, AT .65 CHANGE TO CLAYEY GRAVEL, VERY LIGHT GRAY (N8) ANGULAR POORLY GRADED, SOME SILT
	1.1 to 2.0									NO SAMPLE
			.45'					2.0		(AS ABOVE) - LOWER PORTION OF INT.
Box 1/3	2.15 to 3.4		1.25' (1)	GP			55cm to 2mm 45% VCG to FG 30% FINES	3.0		Gravel in calcite matrix, light gray (N7), angular, poorly graded. Calcite matrix is very pale orange (10 YR 8/2)
	3.4 to 4.6							4.0		NO SAMPLE
	4.0 to 5.2		1.2' (1)	GP			(SAME)	5.0		As above - interval 2.15 to 3.4 with increase in max. gravel size to 7cm.
	5.2 to 7.0						70 2cm 60% VCG-FG 25% FINES 10%	6.0		NO SAMPLE
	7.0 to 8.15		1.15' (1)	GP				7.0		SANDY GRAVEL, MEDIUM LIGHT GRAY (N6) ANGULAR TO SUBANGULAR, POOR TO MODERATE GRADING, SOME CLAY
	8.15 to 9.0							8.0		NO SAMPLE
	9.0-9.2							9.0		NO SAMPLE
10.5 (page 2)	9.2 to 10.35		.8' (1)	GP			60-90 100%			GRAVEL, MED GRAY (N5) SUBANGULAR TO SUBROUNDED, POORLY GRADED

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

β γ BACKGROUND 150-200
BOX 1 50-200 cpm

LOG OF BORING NO. 15-87/ BH 30

DATES DRILLED
ELEVATION
GEOLOGIST(S) DCB/GCE
DATE 7/17/89
CHECKED BY DATE

PROJECT NO 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW	SAMPLE NUMBER	FEET OF CORE IN BOX / FEET OF CORE IN ROW (USCS symbol)	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
↓ Box 1/3	9.2 to 10.35 cont'd		cont'd							(SEE PAGE 1)
Box 2/3	10.35 to ~~12.7~~ 11.5							1 / 11.0		(NO SAMPLE)
		11.5 to 12.7	.85' (1)	GW			60-20cm 80% VCG-FG 30% FINES 10%	12.0		SANDY GRAVEL, MEDIUM LIGHT GREY (N 6), SUBANGULAR TO SUBROUNDED, WELL GRADED, TRACE OF SILT ~~to~~ ~~[illegible]~~
		12.7 to 14.0	~~.7~~ (1)							(NO SAMPLE)
		14.0 to 14.7	.4 (1)	GP			CG-2cm 90% VCG-FG 10%	14.0		GRAVEL, LIGHT GRAY (N 7), ANGULAR TO SUB-ROUNDED, MODERATELY GRADED. TRACE OF SAND AND SILT
		14.7 to 16.0								(NO SAMPLE)
	16.0 to 17.15		.85' (1)	GP			SAME	16.0 / 17.0		(SAME AS ABOVE) reference interval 14.0 to 14.7
	17.15 to 20.0									(NO SAMPLE)

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

βγ BACKGROUND 150-200 cpm
BOX 2 30-190 cpm

LOG OF BORING NO.

. 15-87 / BH 30

DATES DRILLED
ELEVATION
GEOLOGIST(S) DOB / GCE
DATE 7/19/89 - 7/20/89
CHECKED BY DATE

USCS SYMBOL

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (interval)	SAMPLE NUMBER	FEET OF CORE IN BOX (interval)	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2/3 (contd)	20.0 to 21.5		.85' (1)	GW				4.0% 2 70% VCG-FG 28% FINES 2%	21.0		SANDY GRAVEL, MEDIUM GRAY N5, SUB-ANGULAR TO SUBROUNDED, WELL ~~ROUNDED~~ GRADED. TRACE OF SILT
	21.5 to 22.5		1.2' (1)	CL				"	22.0		UPPER 35 ft (AS ABOVE ↑), INTERVAL CHANGES GRADATIONAL TO A SILTY CLAY, VERY LIGHT GRAY (N8), MODERATE PLASTICITY TRACE OF FINE SAND
Box Bottom 24.7 ↓	22.5 to 24.7		1.4' (1)	CL				"	23.0 24.0		AS ABOVE, MOTTLED COLORING PALE YELLOWISH ORANGE (10 YR 8/6), AND VERY LIGHT GRAY (N8)
7/19/89 24.5											
7/20/89 Box 3/3 Box Bottom 27.05 ↓	24.5 to 27.05		(1) 1.65	CL					25 26 27		As above
~~27.05~~ VCB									28		Bottom of boxes 1-3

NOTES General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

βγ DATA (1,2) SEE PGS 1,2
βγ BACKGROUND 150-200 cpm
BOX 3 50-100 cpm

LOG OF BORING NO. BH 15-87

GEOLOGIST(S): LAA
DATE: 8/23/89

PROJECT NO:

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 – 1.7	1.7 (1)				Clay >50%	CL	1		Clay, Pale yellowish orange (10yr 8/6) to Lt. gray (N8) Est plast mod to high Some roots throughout, Some CaCO3 ~~Trace~~ Some silt.
	1.7 – 2.0	2.0 (1)				Clay >50%	CL	2		Same as above Some silt Some Dk yellowish orange Coloring, possibly staining Trace gravel
	2.0 – 3.0	1.1 (1)				Clay >50%	CL	3		Same as above Some gravel Subrounded, to 4.5 cm No roots.
	3.0 – 4.0	1.6 (1)				Clay >50%	CL	4		Silty Clay. White (N9) to yellowish gray (5y 8/1) to Dk yellowish orange (10yr 6/6). Est. plast mod. Some gravel, sub rounded, mod. graded, to 4.5 cm. Some CaCO3
Box 1 of 2	4.0 – 7.0	1.3 (1)				Clay >50%	CL	5, 6, 7		Same as above
	7.0 – 9.5	2.3 (1)				Clay >50%	CL	8, 9		Same as above.
9.5	9.5									
9.5 ↓	9.5 ↓									See Next page for description

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

Nos Box

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 15-87 BH

GEOLOGIST(S): LAP 23
DATE: 8/29/89

PROJECT NO: 1667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 2	12.0	1.15(1)				Clay 90%	CL	11		Gravelly silty Clay. Grayish brown (5yr 3/2) to dk. yellowish brown (10yr 4/2). Est plasticity low to mod Gravel angular to sub angular max size 55cm Sand in clay matrix, v.f g to med grained. Some $CaCO_3$, abundant in upper interval
	17.0	0						12 13 14 15 16 17		No Sample
	19.0	.4(1)				Clay 90%	CL	18 17		Clay Grayish orange to yellowish gray (10yr 7/4) to (5y 8/1). Est. plast. moderate to high. ~~Tra~~ Some $CaCO_3$, trace silt
	24 ↓					Clay 90%	CL			Clay yellowish gray to Lt olive gray (5y 8/1 to 6/1). Est. plast mod to high. Some $CaCO_3$ in upper ⅓ of interval Some silt.

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 15-87

GEOLOGIST(S): LAA
DATE: 8/23/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 2	19.0	2.4 (1)				0.0 to 50%	CL	21, 22, 23		See previous page for descript.
	24.0	0						24, 25		No Sample
25.8	25.8							26, 27, 28, 29		Bottom of Boxes

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 15-87 . PAGE 1 OF 2

ABANDONED HOLE

GEOLOGIST(S): [illegible]
DATE: 8/11/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0-1.9	(1) 2.8					CL/OH	1		CLAY, YELLOWISH-GREY (5 Y 8/1), MOD-HIGH PLAST SOME IRON STAINING AS MOTTLES SOME ROOTS, TRACE OF CARB MATERIAL SLIGHTLY CALC
	1.9-2.0	0.2(1)					CL/OH	2		GREYISH-ORANGE (10 YR 7/4) SAME AS ABOVE W/ SOME GRAVEL, CONSOLIDATED, MAX GRAVEL SIZE = 1.5 cm
	2.0-4.0	0.8					CL/OH	3		SAME AS ABOVE MAX GRAVEL SIZE = 4.5 cm, TRACE CALCITE, SOME VFG-MG SAND
								4		SAME AS ABOVE
	4.0-7.0	(1) 1.0					CL/OH	5, 6		
	7.0-12.0	(2) 3.45					CL/OH	7, 8, 9		SAME AS ABOVE; INCREASING AMOUNT OF CALCITE AT BOTTOM OF INTERVAL

BOX 1 OF 1

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 15-87

GEOLOGIST(S): DAY
DATE: 8/11/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 1 ↑ 12.0							CL/OH	11		SEE PREVIOUS PAGE
								12		
END OF BOXES								13		
								14		
								15		
								16		
								17		
								18		
								19		

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SP 15-87

GEOLOGIST(S): DLJ
DATE: 8/10/89

PROJECT NO: 6667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓ Box 1 of 2	0.0 -2.0	(1) 1.2						1 2		SANDY CLAY, LIGHT GREY (N7) AND DARK YELLOWISH BROWN (10 YR 4/2), MOD PLAST, SOME GRAVEL, SOME ROOTS IN TOP 6 IN, SOME IRON STAINING
	2.0 -4.0	Ø						3 4		NO SAMPLE
	4.0 -7.0	Ø						5 6 7		NO SAMPLE
	7.0 -8.0	Ø						8		NO SAMPLE
	8.0 -10.0	(1) 1.0						9		MG-CG SANDY CLAY, MODERATE YELLOWISH BROWN (10 YR 5/4), MOD PLAST, SOME GRAVEL HIT AT TOP OF INTERVAL

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. SP 15-87

GEOLOGIST(S): [illegible]
DATE: 8/10/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 2	10.0 -12.0	(1) 2.3						11		MG-CG SANDY CLAY, DARKISH YELLOWISH ORANGE (10 YR 6/6) AND LIGHT GREY (N7), MOD PLAST. SOME CARB MATERIAL,
	12.0 -14.5	(1) 2.7						12, 13, 14		SAME AS ABOVE: VFG-FG SAND
14.5 ↓	14.5 -17.0	(1) 1.9						15, 16		CLAY, DARKISH YELLOWISH ORANGE (10 YR 6/6) AND LIGHT OLIVE GREY (5 Y 6/1) MOD PLAST, TRACE OF VFG-FG SAND, TRACE OF CARB MATERIAL TRACE OF SILT (ERASER MARKS) ESP IN TOP OF INTERVAL
Box 2 of 2	17.0 -19.5	(1) 1.75						17, 18, 19		SAME AS ABOVE, LIGHT OLIVE GREY (5 Y 6/1), NO SAND. SOME SILT
END OF BOXES										

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 16-87

GEOLOGIST(S): DCB
DATE: 8/22/89

PROJECT NO: 667-11-22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 to 2.0	(1) .2				>50% Gravel	GC	1, 2		Gravel, dominantly very light gray (N8), angular to subangular, poorly graded, max. size 5.5 cm, trace of clay and sand.
	2.0 to 2.5	(1) .3				>50% Clay	CL	2		Clay, grayish orange (10 YR 7/4), high plasticity, trace of sand, some calcareous mineralization as irregular bodies.
	2.5 to 4.0	DCB 1.0						3		
	4.0 to 4.5	ND				>50% Clay		4		Interval grades to claystone at ~3.7 ft. Claystone, light gray (N7), bedding not apparent, highly weathered, slightly friable, body of calcareous mineralization at ~ 6.4 ft. (est. depth), trace of iron staining on fractures, and possible mn oxide mineralization.
1st ↓	4.5 to 7.0	(1) .6						5, 6		
	7.0 to 8.7	ND						7, 8		Color grades to yellowish gray (5 Y 7/2). Interval grades to siltstone at ~7.8 ft.
Bot	8.7 to 10.5	ND		70° 80°				9		Siltstone, yellowish gray (5 Y 7/2), bedding not apparent, highly weathered, slightly friable, localized iron staining and iron staining on fractures, slight amount of mn oxide mineralization, slight to moderate clay component.

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 16-87

GEOLOGIST(S): DCB
DATE: 8/22/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 2 ↑ 10.5	8.7 to 10.5	ND				75% silt				As above with trace of fg sand below 10.0 ft.
10.5 ↓ Box 2 of 2 ↑ 12.0	10.5 to 12.0	~~ND~~ ~~DCB~~ DCB						11		
								12		Bottom of Box 2 of 2 at 12.0 ft.
								13		

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 16-87 BR

GEOLOGIST(S): LAA
DATE: 8/29/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 – 2.0	(1) 1.85				Gravel >50%	GM	1, 2		Silty ~~Clayey~~ Sandy Gravel Predom med gray (N5) Angular to rounded. Well graded granules to 6cm. Sand med to coarse grained Mod well graded. Some root material, some clay
	2.0 – 3.64	(1) 1.8				Gravel >50%	GM	3		Same as above.
	3.64 – 4.0	0						4		No Sample
	4.0 – 4.95	(1) 1.6				Gravel >50%	GM ~~SC~~	5		Gravel as above Max size 6cm Silty Clay matrix Est. plast low to mod. Grayish orange to white (10yr 7/4) to (N9), Some Caliche
Box 1 of 6	4.95 – 7.0	(1) 1.85				Clay ≈5%	SC	6, 7		Sandy Clay and caliche, Lt brown (5yr 5/6) to white (N9) Est plast low. Sand v.f g to coarse. ~~Weg~~ Lt well graded
	7.0 – 7.9	(1) .5				Gravel ≈4% Sand ≈4%	GM	8		Silty gravel + Sand Gravel Lt gray (N7) to Lt olive gray (5y 6/1). Angular to subrounded Sand v f g. to granules well graded. Gravel mod. graded Trace $CaCO_3$.
	7.9 – 9.0	0						9		No Sample
10.75	9.0 – 10.75	(1) 1.3				Gravel >60%	GW			Gravel No predom color. Angular to sub rounded well graded Granules to 3cm Some sand, well graded v.f g. to granules Trace silt + clay

NOTES. General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 16-87 BR

GEOLOGIST(S): LAA
DATE: 8/29/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION	
10.75	10.75									See previous page for description of this interval	
11.75								11		This box is missing.	Begin New Box
								12			
								13			
								14			
								15			
								16			
								17			
								18			
								19			
20.0											

Box 2 of 6

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible.

Begin New Box

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 16-87BR

GEOLOGIST(S): DCB
DATE: 8/29/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
20.0	20.0 to 22.6	(1) 2				>50% gravel	GC	21, 22		Sandy Gravel, medium light gray (N6), matrix is light brown (5 YR 6/4), subangular to subrounded, moderately graded, max size 4 cm., some clay
						>50% clay	SCCL			claystone, very light gray (N8), bedding not apparent, highly weathered, slightly friable, occasional iron stains
	22.6 to 23.0	0						23		No Sample
	23.0 to 23.9	ND	1			>50% clay				claystone as above (reference interval 22.3 to 22.6 ft).
	23.9 to 26.0	ND						24, 25		
	26.0 to 28.0	ND						26, 27		claystone as above, color grades to grayish orange (10 YR 7/4) ~26 to ~27 ft with increase in iron staining.
	28.0 to 29.4	ND				>50% clay		28, 29		silty claystone, pinkish gray (5 YR 8/1), bedding not apparent, highly weathered, slightly friable, moderate silt fraction, local iron staining.

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 16-87 BR

GEOLOGIST(S): GAA
DATE: 8/29/89
PROJECT NO: 607-122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
30.0	30.0	(1) 1.6				Clay >50%		31		Silty Claystone. Very pale orange (10yr 8/2) Bedding not evident Highly weathered, mod friable. Some iron staining Becomes mod. yellowish brown (10yr 5/4). Toward bottom of interval.
	31.35									
	32.0	0								No Sample.
		1.8 (1)				Clay >50%		32, 33, 34		Same as above has heavy ironization and abundant black mineralization near top of interval
	34.0									
		1.85 (1)				Clay >50%		35, 36		Silty Claystone very lt gray to grayish orange (10yr 7/4 to N8). Highly weathered, mod. friable, Bedding not evident some iron staining
	36.0									
		1.75 (1)				Clay >50%		37, 38		Same as above
	38.0									
		(1) 1.75				Clay >50%		39		Same as above
40.0	40.0									

Box 4 of 6

NOTES. General USCS is modified for this log as follows.
Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 16-87 BR

GEOLOGIST(S): UAA
DATE: 8/29/89

PROJECT NO: 6671122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
								38		
* Box 5 of 6 38.0	38.0 / 40.0	1.8 (1)				Clay >50%		39		Silty claystone Pale yellowish (10yr 6/2). Highly weathered Slightly friable Bedding not evident Some iron staining.

NOTES. General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

* This interval overlaps with Box 4. Started new page

LOG OF BORING NO. 16-87 BR

GEOLOGIST(S): LAA
DATE: 8/29/87

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	40.0	(1) 1.7				Clay >50%		41		Silty Claystone. Grayish orange (10yr 7/4 to 10yr 6/2). Highly weathered, mod friable. Bedding not evident. Some iron staining.
	42.0	(1) 1.8				Clay >50%		42, 43		SAME AS ABOVE w/ color change to light brownish gray (5YR 6/1)
	44.0	(1) 1.75				CLAY 75%		44, 45		SAME AS ABOVE w/ color chg to medium dk gray (N4). SOME CARB. MATERIAL & NO IRON STAINING
Box 5 of 6	46.0	(1) 1.85				CLAY 75%		46, 47		SAME AS ABOVE
48.0	48.0							48		
Box 6 of 6	50.0	(1) 1.8				CLAY 75%		49		SAME AS ABOVE, SOME IRON STAINING

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 16-87 EK

PAGE OF 3

DATES DRILLED:
ELEVATION:
GEOLOGIST(S):
DATE:
CHECKED BY: DATE:

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROCK	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
											No Core
	[illegible]								48 / 49 / 50		Caliche, white (N9, [illegible] friable. At 50 [illegible] to Claystone [illegible] (N7), [illegible]
	[illegible]			0					51 / 52		No Sample
	[illegible]		[illegible]					>50% Clay	53 / 54 / 55		Claystone, medium [illegible] gray (N4), [illegible] (massive?), [illegible] friable, [illegible] and carbonaceous mineral [illegible] [illegible] lenses [illegible] <2.5 mm thick. Slickensides occur [illegible] near surface [illegible] not applicable
	55.5 / 40 / [illegible]		[illegible]						56		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 16-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 3/7/87
CHECKED BY:
DATE:

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
							50'			As above
							50'			Silt, claystone, light gray (N7) bedding not [illegible] (massive?) [illegible]
								58		
			17							
								59		
	60.0									
								60		
			ND							
					NA/55°			61		Fracture [illegible] 61.4 ft. [illegible]
								62		
								63		
			2							
			2					64		
								65		
								66		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 16-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: [illegible]
CHECKED BY: DATE:

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROCK	SAMPLE NUMBER	FEET OF CORE	USCS symbol	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	6[illegible]6 to 6775		2) 2.8					>50% clay			As above
									68		NO SAMPLE
	62.0 to 71.0		(1)					>50% clay	69, 70		As above (ref [illegible] 61.6 to 67.95), bedding may be horizontal [illegible] core breakage, [illegible] [illegible] [illegible] sulfur flower on DCB bedding planes
	71.0 to [illegible]		(1) .1						71		
[illegible]	[illegible] to 74.0		ND						72, 73		
74.0	74.0 to [illegible]								74, 75, 76		75 DCB Slickenside at ~ ~~55~~ ft. 60° angle, Coal body ~1.5cm in thickness also occurs at this depth and angle. At 75 ft interval grades to [illegible] Clay yellowish gray (5Y 7/2), bedding not apparent (massive?)

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 16-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 8/7/89
CHECKED BY:
DATE:

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN BOX	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	76.0							750' clay			At 76 [illegible] interbedded Claystone and siltstone, medium gray (N5) [illegible] (N7) respectively, [illegible]
13	[illegible]								78		[illegible] very [illegible] weathered, moderately friable, carbonaceous. [illegible] siltstone light gray (N7), bedding not apparent, weathered, mod. friable.
	79.2								79		
	79.2 To DCB 80.0		0	DCB							No Sample
	80.0							750' clay	80		Claystone medium light gray (N6), bedding not apparent (massive?) weathered slightly friable; slight silt fracture and occasional short intervals of silt
	to								81		
			ND						82		
									83		
	84.0								84		
84.0	84.0										
	to		ND						85		
Box 4 of 13									86		
	88.0										

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 16-87 BR

PAGE 5 OF 13

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCL
DATE: 2/7/[illegible]
CHECKED BY:
DATE:

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET (ELEVATION)	SAMPLE NUMBER	FEET OF CORE	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	84.0 to 88.0		ND					750' clay			As above
	88.0 to 92.0		ND						88, 89, 90, 91, 92		
92.5	92.5		ND								
92.5	92.5 to 96.5		ND						93, 94, 95, 96		
	96.5 to [illegible]		ND								

Box [illegible]

Box [illegible]

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 16-27 ER

PAGE 6 OF [illegible]

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): [illegible]
DATE: 8/7/89
CHECKED BY:
DATE:

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET (MEAS/CALC)	SAMPLE NUMBER	FEET OF CORE (MEAS/CALC)	FEET OF CORE (MEAS/CALC)	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 5 of 3	96.5 to 97.1		ND				0 to 10°	>50% clay; >50% silt	98, 99		As above, interval grade to siltstone below 97 ft. Siltstone, very [illegible] (N8), thin bedded <1mm, horizontal to 10° dip, weathered, slightly friable.
	99.8 to 100.5		X	0					100	X	No Sample
Box 5 of 3; Box 6 of 3	100.5 to 101.7		ND				~~0~~ DCB ~~to~~ 10°	>50% silt	101		Siltstone, [illegible] (N8), thin bedded <1mm, horizontal to 10° dip, weathered, slightly friable, slight sand fraction very fine grained, interbedded
Box 6 of 3	101.7 to 105.0		ND						102, 103, 104		
	105.0 to [illegible]		ND						105, 106		As above with abundant very fine grained sand from 105.0 to 105.4.

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

Interval blocks read 101.7, box read DCB 100.7. Core measurements indicate 101.7 is probably correct.

LOG OF BORING NO. 16-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 8/7/89
CHECKED BY:
DATE:

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	DECODING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	115.0					DCB	10°	>50% silt			As above
	to		ND						108		
	117.0								109		
	117.0										
	to		ND						110		
									111		
									112		
			0	~~Ø~~ DCB							No Sample
3.0							10°	>50% silt	113		As above
									114		
	to		ND	~~Ø~~ DCB					115		
									116		
	117.0										

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 16-87 DR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 8/7/89
CHECKED BY:
DATE:

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FOOT (IN FEET)	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	117.0 to 121.0		ND				0°	>50% silt	118, 119, 120		
121.5	121.0 to 121.5		ND						121		As above, .75 [illegible] bedding is dominantly [illegible] bioturbation otherwise roughly [illegible] thin bedded [illegible] interbedded silt [illegible] clay, small [illegible] in bedding.
121.5	121.5 to 124.4		ND						122, 123, 124		
	124.7 to 125		0						125		No Sample
	125 to 129		ND				>10°	>50% silt, >50% clay	126		Siltstone, light gray (N7), [illegible] bedding with some wavy bedding, weathered, slightly friable. Interval grades to Claystone at ~125.6. Claystone olive gray (5Y 4/1), bedding ~10° based

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 16-57 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 9/71
CHECKED BY: DATE:

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROCK	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	125 to 129		(1)				10°	>50 clay	128		cont'd from previous page), on core breaks, weathered slightly friable, carbonaceous mineralization occurs locally fossil leaf at ~126.4 short intervals of siltstone occur, occasionally
13	129 to 132.5		22						129, 130, 131, 132		
132.5	132.5 to 133		(1)								
133	133 to 137		(1)				10°	>50 silt	133, 134, 135, 136		Interval grades to siltstone at 132.4. Siltstone light grey (N7), thin bedded, weathered, slightly friable, occasionally interbedded with claystone.

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 16-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 3/7/87
CHECKED BY:
DATE:

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	137.0						10°	>50 silt			As above within very fine sand fraction. Interval [illegible] sandstone [illegible] ~140.5 ft sandstone light gray (N7), thin bedded, weathered, slightly friable, very fine grained, abundant silt
1 B Box	to		ND						138		
									139		
									140		
141.0								>50 sand			
141.3	141.3								141		
									142		
	to		ND						143		
10 B Box								>50 silt	144		Interval grades to siltstone at ~144.8 ft. Siltstone, light gray (N7), thin bedded, <2.5 mm, weathered, slightly friable, slight clay and vfg sand fraction
	144.9										
	144.9								145		NO SAMPLE
	145.0						30B 10°	>70 mg sand <30 FG sand			Sandstone, light gray (N7), thin bedded <2 mm, weathered, slightly friable, medium to fine grained, moderately sorted, [illegible]
	to		ND					>50 silt	146		Interval grades to siltstone at ~145.4 ft. Siltstone, light gray (N7),
	147.2										

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 16-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 8/8/89
CHECKED BY:
DATE:
USCS symbol
PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	145.0 to 148.2		ND				DCB	>50 clay	148		(cont'd from previous page) thin bedding <2.5 mm, convolute bedding possible; bioturbation, load casts visible in slab, weathered, slightly friable. Interval grades to ~~clay~~ silty claystone at 147.0 ft. Claystone, light gray (N7), bedding to
	148.2 to 149.0		0						149	X	No Sample
5/2/90 B 100 Box 151.0	149.0 to 151.0		ND					>50 clay	150		not apparent weathered, slightly friable, slickensides occur at ~150.0 ft ~70° angle, slight to moderate silt fraction
	151.0 to 153.0		ND						151, 152		
	153.0 to 157.0		ND				? 30°	>50 silt	153, 154, 155, 156		Interval grades to siltstone at 153.0 ft. Siltstone, light gray (N7), thin bedded, wavy, weathered, slightly friable, slight clay fraction, carbonaceous mineralization along bedding plane at approximately 155 ft

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 16-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 8/8/89
CHECKED BY:
DATE:

USCS symbol

PROJECT NO: 667-11.22

Top/Bottom of Core in Box	Top/Bottom of Core in Box	Sample Number	Feet of Core	Feet of Core	Fractures per Foot	Fracture Angle	Bedding Angle	Grain Size Distribution	Depth in Feet	Lithologic Log	Lithologic Description
B 110' Box ↑ 159.1	157.2 to 159.7		ND				~~70°~~ 35°	>50' SH	158 151		As above with increase in sand fraction below 157.3 ft. Sandy Siltstone.
159.9 ↓	159.7 to 161.0		ND				30°	~50' SH ~50' clay	160		Interbedded siltstones and claystones at 160 ft. [illegible] intervals above.
B 12' Box	161.0 to 163.0		ND				50°	>50' silt >50' clay	161 162 163		Siltstone, [illegible] bedded, <2mm [illegible] weathered, slightly friable, localized carbonaceous mineralization. Grades to claystone at 162.3 ft. Claystone, medium gr. (N5), bedding not apparent (massive), weathered, moderately friable, slight silt fraction.
	163.0 to 165.0		0						164 165		No Sample
	165.0 to 169.5		ND					>50' clay	166		As above (reverse interval 162.3 to 162.3-4)

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 16-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCE
DATE: 7/1/89
CHECKED BY:
DATE:

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN BOX (FT BELOW)	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	165.0							250+ clay			As above
	1r		ND						168		
169.5	169.5								169		
169.5	169.5										
									170		
	do								171		
Box									172		
									173		
174.0	174.0								174		Interval grades to ~~silty~~ silty cl at 173.2 ft. Silty Claystone, light gray (N7), bedding not apparent (massive?), weathered, slightly friable. Bottom of Box 12/12 ft 174.0
									175		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 17-87

GEOLOGIST(S): DCB
DATE: 8/11/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 1	7.0									As above
	to							11		
↑ 12.0	12.0									
								12		Bottom of Box 1 of 1 at 12.0 ft.
								13		

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 17-87

Abandoned Hole III

GEOLOGIST(S): DCB
DATE: 8/11/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 (according to outside of Box)	7	(1) 1.3				>50% clay	CL	1		Clay, light gray (N8), mottled grayish brown (10 YR 7/4), moderate plasticity, some roots and plant debris in upper 0.3 ft., trace of gravel and calcareous mineralization.
	2.0							2		
	2.0 to 4.0	(1) .15						3		
	4.0					>80% Gravel	GC	4		Clayey Gravel, medium light gray (N6), clay matrix is brownish gray (5 YR 6/1), poorly graded, subangular, max size 8 cm, some silt and sand trace of calcareous mineralization in clay matrix
Box 1 of 1	4.0 to 7.0	(1) .85						5		
								6		
	7.0							7		
	7.0					>80% Gravel	GC			Sandy, Clayey Gravel, medium light gray (N6), clay matrix is moderately yellowish brown (10 YR 5/4) poorly graded, angular, max. size 5 cm
	7.0 to 12.0	(1) 1.9						8		
								9		Claystone, very light gray (N8), laminar bedding and soft sediment deformation, well weathered, slightly friable, localized iron staining, calcareous bodies and carbonaceous partings, trace of sand + gravel at ~12 ft.

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 17-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DAT
DATE:
CHECKED BY: DATE: 8/8/89

USCS symbol

PROJECT NO: 667-11.22

Depth Interval	Core Run	Recovery	Footage	USCS Symbol	Fracture Freq	Fracture Angle	Rock Type	Blows per 6 in	Depth in Feet	Graphic Log	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0-2.0		(1) 1.35	GC					1		TOP 8 IN: SANDY GRAVEL, MODERATE BROWN (10 YR 4/2), ANGULAR-SUBANGULAR, MAX SIZE = 5 CM, SOME SILT, SOME CLAY, SOME ROOTS. BOTTOM OF INTERVAL - GRAVELLY CLAY, DARK REDDISH BROWN (10 R 3/4), MOD PLAST, SOME SAND (FG-MG), SOME SILT
	2.0 -3.5		(1) 1.4	GC					2, 3		CALCAREOUS CLAYEY GRAVEL - MODERATE ORANGE PINK (5 YR 8/4), ANGULAR TO SUBANGULAR, MOD-WELL GRADED, MAX SIZE = 4.5 CM, SOME SAND (FG-VCG).
	3.5-5.0		(1) ~~1.85~~ .80	GC					4		SAME AS ABOVE
	5.0 -6.5		(1) 1.10	GC					5, 6		SAME AS ABOVE, DARK YELLOWISH ORANGE (10 YR 6/6) MAX SIZE OF GRAVEL = 2 MM
	6.5-8.0		∅						7		NO SAMPLE
	8.0 -9.5		(1) 1.3	GC					8, 9		SAME AS ABOVE
			∅								NO SAMPLE

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 17-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DAT
DATE:
CHECKED BY:

USCS SYMBOL

DATE: 8/8/89

PROJECT NO: 667-11.22

Top/Bottom of Core in Box	Top/Bottom of Core in Box	Sample Number	Feet of Core	Feet of Core	Fractures per Foot	Fracture Angle	Bedding Angle	Grain Size Distribution	Depth in Feet	Lithologic Log	Lithologic Description
Box 1 of 3	10.0 - 12.0		(1) 1.65	GC					11		SANDY CLAYEY GRAVEL, LIGHT BROWN (5YR 5/6), ANGULAR - SUBANGULAR, MOD - WELL GRADED MAX SIZE = 5 CM, SOME SILT, FLOURY TEXTURE, SLIGHTLY CALCAREOUS. BOTTOM OF INTERVAL IS CONSOLIDATED, ~~AND GRAVEL IS SMALLER~~, CONTAINS TRA OF BIOTITE GRADING IS MOD
	12.0 - 14.0		(1) 09	GC					12, 13		SAME AS ABOVE, NO BIOTITE
14.0 ↑	14.0 - 16.0		(1) 1.15	GC					14, 15		SAME AS ABOVE, NOT CALCAREOUS, ~~FLOUR~~
Box 2 of 3	16-18		(1) 055	GC					16, 17		SAME AS ABOVE; FLOURY TEXTURE
	18.0 - 19.3		(1) 1.35	GC					18, 19		SAME AS ABOVE
	19.3 - 20.3		(1) 1.35	GC							SAME AS ABOVE

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 17-B97

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DAT
DATE:
CHECKED BY:
DATE: 8/8/89

PROJECT NO: 667-11.22

Box	Depth	Recovery	Blows	USCS (Visual)	Fracture Angle	Fracture Type	Roughness	Other	Depth in Feet	Symbol	Lithologic Description
Box 2 of 3	20.3-22.3		(1) 0.95	GC					21, 22		SANDY CLAY & GRAVEL, LIGHT BROWN (5 YR 5/6) SO ANGULAR - SUBANGULAR, MOD - WELL GRADED, MAX SIZE = 6 CM, SOME SILT
	22.3-24.3		(1) 1.40	GC					23, 24		SAME AS ABOVE, DARK YELLOWISH ORANGE (10 YR 6/6)
	24.3-26.3		(1) 1.35	GC CL					25, 26		TOP 4 IN SAME AS ABOVE; MODERATE YELLOWISH BROWN. (10 YR 5/4) BOTTOM OF INTERVAL ~~CLAY~~ SILTY CLAY, PALE YELLOWISH ORANGE (10 YR 8/6), SOME V, F, G SAND HIGH PLAST
↑ 27.3	26.3-~~28.3~~ 27.3		0.95	CL					27		SAME AS ABOVE MOTTLED - COLORING OF VERY LIGHT GREY (N8) AND DARK YELLOWISH ORANGE, PLAST IS MOD.
Box 3 of 3	27.3 27.3-28.3		(1) 1.1	CL					28		SAME AS ABOVE - MOD-HIGH PLAST
	28.3-30.3		(1) 2.1	CH/CL					29		CLAY, LIGHT BROWNISH GREY (5 YR 6/1) MOD-HIGH PLAST, SOME SILT, IRON STAINING AS MOTTLES

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 17-89 7 day

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DAT
DATE:
CHECKED BY:

USCS symbol

DATE: 8/8/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FOOT (IN FEET)	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
30.3											SEE PREVIOUS PAGE
END OF BOXES									31		
									32		
									33		
									34		
									35		
									36		
									37		
									38		
									39		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 17-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:
DATE: 8/7/89

PROJECT NO: 667-11.22

USCS symbol

Top/Bottom of Core in Box	Top/Bottom of Core in Box (in Feet)	Sample Number	Feet of Core	Feet of Core in Box	Fractures per Foot	Fracture Angle	Bedding Angle	Grain Size Distribution	Depth in Feet	Lithologic Log	Lithologic Description
0 0 ↓	0 0 to 2 0		1.8(1)	GC				Gravel >50%	1		Clayey gravel Subangular to subrounded (cannot distinguish color of gravel) Matrix pale brown (5yr 5/2). Silty calcareous clay. Gravel mod. graded Max size 5 5cm Grass + root material @ surface. Grades to to gravelly caliche. Gravel as above
	2 0 to 4 0		1.8(1)	GC				Gravel ≈20% Caliche + silt >50%	2, 3		Gravelly. caliche + rock flour Gravel mod gray (N5) Subangular to subrounded Mod well graded. Max size 2 5cm Caliche + rock flour white
	4 0 to 4 5		7(1)	CL				Clay >50%	4		More clay in matrix at bottom of interval. ~~Gravelly~~ sandy clay. Some silt Est plast. low to mod Grayish orange (10yr 7/4)
	4 5 to 4 8		0								No Sample
Box 1 of 2				CL				Clay >50%	5		~~Sandy~~ Silty Clay. Pale yellowish brown. (5yr 6/2) Est. plast moderate Some CaCO3 sand Some gravel To 2 cm
	4 8 to 5 0		.7(1)	CL				Clay >50%	6		
	4 8 to 6 8		.65(1)	CL							
	6 8 to 8 8		1.3(1)	CL				Clay >50%	7, 8		~~Sandy~~ Silty Clay. Same as above Grades to gravel + caliche
8 8 ↓	8 8 to 11 8		.2(1)	CL				Clay >90%	9		Clay. Yellowish gray (5y 8/1). Est. plasticity mod. to high Trace carb material

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 17-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY: DATE:

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN SIZE	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	USCS symbol	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	8.8 to 11.8		.2(1)	CL					11		See previous page for descript.
	11.8 to 13.8		0						12, 13		No Sample
	13.8 to 15.3		1.1(1)					Grav >50%	14, 15		Clayey gravel Gravel predom. Med Lt gray (N6) Angular to subangular well graded Max size 4cm. Matrix Light brown 5yr 6/4 Silty sandy clay Low plasticity Sand-well graded-vf grained to vc grained. Slightly calcareous
	15.3 to 23.3		1.8(1)					Clay >70%	16, 17, 18, 19		Gravelly clay Grayish orange (10yr 7/4) Est plasticity Mod to high Some sand Gravel Angular to subrounded. Poorly graded max size ≈ 2cm. Matrix Slightly $CaCO_3$

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 17-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:
DATE: 8/7/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN DEPTH	TOP/BOTTOM OF CORE IN DEPTH	SAMPLE NUMBER	FEET OF CORE	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	15.3 to 23.3			CL				Clay >70%	21, 22, 23		See above page for descriptions
	23.3 to 26.3		1.75 (1)	CL				Clay >60%	24, 25, 26		Gravelly Clay Grayish orange (10yr 7/4) Est Plasticity. Mod to high Some sand Gravel angular to sub rounded. Poorly graded Max size ≈3.5 cm LA Matrix slightly. Calcareous
	26.3 to 35.9		.5 (1)	CL				Clay >60%	27, 28, 29		Clay Lt gray (N7). Est plasticity high Some gravel - mostly small One piece 5.5 cm

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 17-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:

USCS symbol

DATE: 8/7/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROCK	SAMPLE NUMBER	FEET OF CORE	USCS symbol	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
											See above page for description.
									30		
									31		
									32		
									33		
									34		
									35		
	35.9*								36		
	35.9* to ?		1.25(1)	CL				Clay >70%			Gravelly clay Grayish orange (10yr 7/4) Est plasticity moderate to high. Some sand. Gravel angular to subrounded Poorly ~~sorted~~ graded Max size 3.5cm Matrix slightly calcareous

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

* There is no end marker in box. Box is marked that it ends @ 15.3 but core is marked as far as 35.9

LOG OF BORING NO. BH 17-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 7/27/89
CHECKED BY: DATE:

USCS symbol

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE (in ft. interval)	SAMPLE NUMBER	FEET OF CORE (NOTE: if USCS symbol is used, indicate feet of core in run)		FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 to 1.4		ND					>50% clay	1		Silty Clay, light olive gray, moderate plasticity, some gravel, root fragments and plant debris in upper .3 ft
	1.4 to 2.0		~~ND~~						2		No Sample
	2.0 to 3.65		ND	CL				>50% clay	3		Clay, Moderate brown, (5 YR 4/4), high plasticity, trace of gravel, trace of roots.
	3.65 3.9		ND								
	3.9 to 5.25		0						4, 5		No Sample
Box 1 of 2	5.25 to 6.70		ND					>50% clay	6		A^DCB Clay, dark yellowish orange (10 YR 6/6), high plasticity trace of silt and carbonate mineralization and gravel.
	6.70 to 7.40		ND						7		Color changes are gradually at 6.7 ft. (est.) ~~yellow~~
7.7	7.4 to 7.7		ND								As above, yellowish gray (5 Y 7/2).
7.70	7.7 to 9.2		(1) 8						8		
Box 2 of 2	9.2 to 10.0		(1) .6					>50% clay	9		Claystone dark yellowish orange (10 YR 6/6), bedding not apparent (massive), highly weathered, moderately friable,

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 17-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 7/27/89
CHECKED BY:
DATE:

USCS symbol

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	10 0 to 10 25		ND				>50 clay			(cont'd. from previous page), iron staining on fractures
	10 25 to 11.8		ND		65°			11		
12.4	11 8 to 12.4		ND					12		
								14		Bottom of Box 2 of 2 at 12.4 ft.

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. DH 17-87

"split Spoon Driven Sample" as labeled on outside of box

GEOLOGIST(S): PCB
DATE: 8/11/87

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 to 1.5	(1) .2						1		Clay, grayish orange (10 YR 7/4), moderately high plasticity, some calcareous mineralization, silt and fine gravel, local occurrences of calcareous mineralization
	1.5 to 3.0	(1) .9						2		
Box 1 of 1	3.0 to 4.5	(1) .3						3		
	4.5 to 6.0	(1) .8						4		
↑ 6.0	6.0							5		At ~ 5.9 ft. As above color grades to moderate brown (5 YR 3/4), calcareous mineralization is absent.
								6		Bottom of Box 1 of 1 at 6.0 ft.
								7		
								8		

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 17-87 (2)

PAGE 1 OF 2

GEOLOGIST(S): DCB
DATE: 8/16/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 to 1.8	ND				>50' clay	CL	1		Clay, grayish orange (10 YR 7/4), ~~moderately~~ high plasticity, some silt gravel and roots, ~~trace of~~ DCB ~~sand~~ DCB calcareous
	1.8 to 2.0	ND				>50' clay	CL	2		Sandy Clay, grayish orange DCB (10 YR 7/4), to grayish red (10 R 4/2), low plasticity, some gravel and silt, calcareous mineralization as small bodies <1mm.
	2.0 to 3.3	ND				>50' clay	CL	3		Clay, grayish orange (10 YR 7/4), moderate plasticity, some silt and gravel, calcareous minerals as small bodies <1mm.
	3.3 to 4.0	(1) .35						4		
	4.0 to 7.0	(1) 1.5						5, 6, 7		
	7.0 to 12.0	0						8, 9		No Sample

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 17-87 (2)

GEOLOGIST(S): DCB
DATE: 8/16/89

PROJECT NO: 667-1622

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	7.0 to 12.0	0						11		No Sample
Box 1 of 1	12.0 to 17.0	(1) 25				>50% clay / >50% clay	CL	12 13 14 15 16 17		Sandy Clay, moderate yellowish brown (10 YR 5/4), low plasticity, some silt and gravel. Silty Claystone, mottled by iron staining, very light gray (N8), grayish orange (10 YR 7/4) to dark yellowish orange (10 YR 6/6), bedding not apparent, highly weathered, moderately friable, significant fraction of vfg sand (>10%). Lower portion of interval is claystone as above with local depth in real section (Mg, C?), silt and sand fraction are absent.
								18		Bottom of box 1/1 at 17.0 ft.

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BR 18-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): 28D
DATE:
CHECKED BY:
DATE: 8/8/89
PROJECT NO: 667-11.22

USCS symbol

Top/Bottom of Core in Box	Top/Bottom of Core in Box	Sample Number	Feet of Core	Feet of Core	Fractures per Foot	Fracture Angle	Bedding Angle	Grain Size Distribution	Depth in Feet	Lithologic Log	Lithologic Description
0.0 ↓	0.0 TO 2.0		ND	GC				50% 15 75mm	1		Clayey gravel - matrix is mod. brown (5YR 3/4), subangular to subrounded, mod-well graded, max size ≈ 6cm, some sand, trace of roots, ~~becoming~~ 2D calcareous in bottom 6 in. of interval
	2.0 TO 4.0		ND	GC					2, 3		Top 6" of interval is cliche - very pale orange ~~to~~ (10YR 8/2) to mod. orange pink (5YR 8/4), trace of gravel. Bottom 1.5 ft of interval is a calcareous gravel - matrix is very pale orange (10YR 8/2), angular to subrounded, mod well graded, max size = 6cm, some sand.
Box 1 of 3	4.0 TO 7.7		(1) 1.9						4, 5, 6, 7		Same as above, trace ~~to~~ ~~some~~ 2D clay.
	7.7 TO 10.2		0	—					8, 9		No Sample

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BR 18-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD
DATE:
CHECKED BY:

USCS symbol

DATE: 8/8/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN DEPTH	TOP/BOTTOM OF CORE IN DEPTH	SAMPLE NUMBER	FEET OF CORE	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
BOX 1 of 3	10.2 TO 12.7		0	–					11, 12		NO SAMPLE
	12.7 TO 15.2	TSD-3	0.6 (1)	SP				>50% is >C.G.	13, 14, 15		Gravelly Sand (F.G. TO V.C.G) - lt. brown (5YR 5/6), subangular TO subrounded well graded, max gravel size = 4.5cm Trace of Clay.
	15.2 TO 17.7		0.5 (1)	SC				>50% is >V.C.G	16, 17		same as above; w/ some clay
	17.7 TO 20.2		0.5 (1)	GP					18, 19		Sandy gravel - lt brown (5YR 5/6) subangular to rounded, mod. grading; max size = 6 cm, trace of clay

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BR18-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSO
DATE:
CHECKED BY:

USCS symbol

DATE: 8/8/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FOOT	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	DECIDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
BOX 1 of 3 ↑ 22.7	20.2 TO 22.7	(1) 1.9		GC				>50% is >2mm	21, 22		Gravel - grayish orange (10YR 7/4) angular to subrounded, mod to poorly graded, max size ≈ 4.5 cm, some sand & clay
22.7 ↓	22.7 TO 25.2	0		—					23, 24, 25		
BOX 2 of 3	25.2 TO 32.7	0		—					26, 27, 28, 29		NO Sample

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BR 18-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSO
DATE:
CHECKED BY:

USCS symbol

DATE: 8/8/89

PROJECT NO: 667-11.22

Top/Bottom of Core in Box	Top/Bottom of Core in Feet	Sample Number	Feet of Core	Feet of Core	Fractures per Foot	Fracture Angle	Bedding Angle	Grain Size Distribution	Depth in Feet	Lithologic Log	Lithologic Description
Box 2 of 3	25.7 TO 32.7		0						31, 32		NO SAMPLE
	32.7 TO 35.2		1.2 (2)						33, 34, 35		Silty claystone - mottled lt. gray (N7) to DK yellowish orange (~~DK yellowi~~ (10 YR 6/6), bedding non apparent, highly weathered, mod. friable, highly fractured, some iron staining as mottles heavy in fractures, some carb staining. (fractures are predominantly vertical
	35.2 TO 37.7		2.1 (2)						36, 37		Same as above; lt olive gray (5Y 6/1) to DK yellowish orange (10 YR 6/6), & mod.-highly friable.
	37.7 TO 40.2		ND						38, 39		Same as above; mod. friable

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BR 18-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD
DATE:
CHECKED BY:

USCS symbol

DATE: 8/8/89

PROJECT NO: 667-11.22

Top/Bottom of Core in Box	Top/Bottom of Core in Box (in Feet)	Sample Number	Feet of Core in Box	Feet of Core	Fractures per Foot	Fracture Angle	Bedding Angle	Grain Size Distribution	Depth in Feet	Lithologic Log	Lithologic Description
BOX 2 of 3 ↑ 42.7	40.2 TO 42.7		(2) 2.5						41, 42		Silty claystone - mottled lt. olive gray ~~to~~ (5Y6/1) to dk yellowish orange (10YR 6/6), bedding is nonapparent, highly weathered, highly to mod. friable, highly fractured (predominantly vertical, some iron staining as mottles & in fractures, some carb material becoming abundant at bottom of interval.
42.7 ↓	42.7* TO 52.7								43, 44, 45, 46, 47, 48, 49		Same as above; medium gray (N5) to dk yellowish orange (10YR 6/6) mod. friability, abundant carb material At approx. 44.2 to 45.4 The rock becomes very crumbly & varicolored (from a dusky red (5R 3/4) to a dusky brown (5YR 2/2) & includes the above colors) & is slightly calc. Claystone - dusky yellow (5Y 6/4) & med lt gray (N6) mottled & brownish black massive bedding, highly weathered, mod friable, iron staining in fractures & as mottles, some carb material, & silt At approx. 47.7 ft. - Same as above; med. lt. gray (N6), iron staining in fractures to about 48.5 ft. only, trace of carb material
BOX 3 of 3											

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

* what few marker blocks are in the box are all mixed up, & dont correlate w/ the markings on the box.

LOG OF BORING NO. BR 18-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD
DATE:
CHECKED BY:

USCS symbol

DATE: 8/8/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN BOX (IN FEET)	SAMPLE NUMBER	FEET OF CORE IN BOX (IN FEET)	FEET OF CORE IN BOX	FRACTURES PER FOOT	FRACTURE ANGLE	DIPPING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
↑ Box 3 of 3 52.7	42.7 TO 52.7								51		see previous page.
									52		
									53		Bottom of boxes

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 15-5-BR

GEOLOGIST(S): UAA
DATE: 8/17/89

PROJECT NO: 6 7 11 22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
								51		
								52		
								53		
								54		Begin ~~New~~ UA Boxes
Box 1 of 9	54.0	* 1.75 (1)			Clay >70%			55		CLAYSTONE - lt. brownish gray (5YR 6/1) Mod weathered, mod. FRIABLE. bedding NOT EVIDENT SILTY IN AREAS, SOME SILT THROUGHOUT MATRIX. mildly CALCAREOUS throughout MATRIX
	55.5									SILTY CLAYSTONE - SAME AS ABOVE NON-CALCAREOUS, TRACE CARB MATERIAL
	56.0	45 (2)			Clay >70%			56		SILTY CLAYSTONE - Lt BROWNISH-GREY (5YR 6/1) Mod weathered, slightly to mod. FRIABLE. MILDLY CALCAREOUS
	57.3	12 (1)			Clay >70%			57		
	58.0	0 ~~1.75~~ (2) ~~35~~						58		No Sample
	59.6	1.75 (1) ~~35~~			Clay >70%			59		Claystone. Lt brownish gray (5YR 6/1) Mod to highly weathered, Mod Friable Bedding not evident Vertical and horizontal fractures. (No staining in fractures.) Some silt trace black carb material
	60.0	.35 (1)			Clay >70%					Same as above

NOTES. General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

* Had to erase to correct measurement - UAA 8/17/89

LOG OF BORING NO. 18-87BR

GEOLOGIST(S): LAA
DATE: 8/17/89

PROJECT NO: # 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 9 →	60.0 – 61.45	1.3(1)				Clay >50%		61		Claystone Brownish gray to olive gray (5yr 4/1 to 5y 4/1) Highly weathered Highly friable Bedding appears to be in thin uneven horizontal layers surfaces have a grainy appearance but does not have bandon matrix Some silt in areas, mildly calcitic in areas
63.2	63.2	1.7(2)				Clay >50%		62, 63		Same as above Does not have same grainy texture Bedding not evident No $CaCO_3$
63.1	63.1 – 64.25	1.1(2)				Clay >50%		64		Silty Claystone. Lt. olive gray (5y 6/1) Mod weathered Slightly friable Bedding not evident. Trace carb Material
	65.0	0						65		No Sample
Box 2 of 9	65.5	5(2)				Clay >50%				Same as above
	67.4	1.7(1)				Clay >50%		66, 67		Silty Claystone. Brownish gray (5yr 4/1) Mod weathered Mod friable Bedding not evident Trace carb. material. Trace $CaCO_3$ in matrix
	69.0	0						68, 69		No Sample
	69.0 ↓	1.9				Silt >80%				Siltstone Yellowish gray (5y 8/1) Mod weathered Slightly to mod friable Bedding not evident

Begin new box →

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 18-87 BR

GEOLOGIST(S): LAA
DATE: 8/17/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 9	↑ 71.75					Silt >50%		71		Siltstone See previous page for description
	73.0	1.2(1)				Silt >50%		72		Siltstone Lt olive gray to olive gray (5y6/1 to 4/1). Mod weathered. Slightly to mod friable Bedding not evident Trace iron staining, carb material
	73.5	.5(1)				Silt >50%		73		Siltstone as above w/thin (75cm) clayer claystone Bedding appears horizontal, uneven.
75.2	75.2	1.8(1)	SL			Silt >50%		74		Siltstone yellowish gray (5y 8/1) to Lt. olive gray (5y 8/1) Mod. weathered. Mod. to slightly friable near horizont Thin layered bedding (< 1mm) to 10mm Some v.f g Sand in the layers Some carb. material.
Box 3 of 9	77.0	.4(1)				Clay >50%		76		Silty Claystone Olive gray (5y4/1) Mod weathered Slight friable. Bedding not evident. Some carb. Material Trace iron staining Matrix very mildly calcitic — Begin Box 3 ↓
	* 78.4	1.3(1)				Clay >50%		77		Silty Claystone Olive gray (5y4/1) to Pinkish gray (5yr 8/1). Mod. weathered Slightly to mod friable. Bedding may be thin horiz layers (from weathering Some ~~ok~~ grayish orange (10yr 7/4) discoloration in matrix Trace carb material. Siltier @ bottom
	79.0	.6(2)				Clay >50%		78		Silty claystone. Olive gray (5y 4/1) to yellowish gray (5y 8/1 Slightly weathered. Slightly friable Thin layered horizontal bedding Some carb. material + iron staining
	79.9	1.1(1)				Clay >50%		79		Same as above Mod friable

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

* had to erase line. 8/17/89 LAA

LOG OF BORING NO. 18-87 BR

GEOLOGIST(S): LAA
DATE: 8/17/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION	
Box 3 of 9	79.9	1.1 (1)				Clay >50%				Claystone Olive gray (5y 4/1) Mod. weathered. Mod friable. Layered Bedding (from weathering). Abund- and carb material between layers Some mod yellowish brown discoloration (10yr 5/4)	
	81.0							81			
	81.6	.6 (1)				Clay >50%				Silty Claystone Brownish gray (5yr 4/1) Slightly weathered Slightly friable Bedding not evident. Some dk yellowish brown discoloration in matrix Trace carb. material	
		1.85 (2)				Clay >50%		82		Same as above	
	83.5							83			
		1.1 (1)				Clay >50%		84		Silty Claystone Lt. olive gray to Lt. brownish gray (5yr 6/1 to 5y 6/1) Highly weathered, Mod friable Bedding not evident Rusted nail found in matrix.	
	85.0							85			
85.8	85.8	.7 (1)				Clay >50%				Claystone Lt. olive gray (5y 6/1) Mod weathered. Mod friable Bedding not evident	
								86		End Box 3	~~Begin Box 4~~ LA
		LA ~~.85~~						87			
88.0	88.0							88			
Box 4 of 9		.85 (1)				Clay >50%				Claystone Lt brownish gray (5 yr 6/1) to Brownish gray (5 yr 4/1) Mod. weathered, mod friable. Bedding not evident. Some silt	Begin New Box
	88.8										
	88.8 ↓ 90.0	LA ~~.80~~ 0 (4)						89		No Sample	

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 18-87 BR

GEOLOGIST(S): UAA
DATE: 8/17/89

PROJECT NO: 067-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 4 of 9	90.0 – 90.8					Clay 75%				Silty Claystone Lt. brownish gray (5yr 4/1) Mod weathered Slightly friable Bedding not evident. Trace carb. material
	90.8 – 91.9	1.1 (1)				Clay 75%		91		Same as above
	91.9 – 92.0					Clay 75%		92		
	92.0 – 92.5	.6				Clay 75%				Same as above
	92.5 – 94.0	1.6 (1)				Clay 75%		93		Same as above.
	94.0 – 96.3	1.65 (1)				Clay 75%		94, 95, 96		Same as above
	96.3 – 97.0	0						97		No Sample
	97.0 – 99.0	1.6				Clay 75%		98, 99		Same as above.
99.0	99.0 –	1.6 (1)				Clay 75%				Same as above

Begin Box 5

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 18-87 BR

GEOLOGIST(S): LAA
DATE: 8/17/89

PROJECT NO: 6674122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 5 of 9	100.75					Clay >50%				See previous page for description.
	101.0	.3(1)				Clay >50%		101		Claystone. Lt olive gray (5y 6/1) Mod weathered mod. friable. Bedding not evident. Some silt. Trace carb. mat.
	102.2	1.0(1)				Clay >50%		102		Same as above. Some carb material.
	104	.5(1)				Clay >50%		103		Same as above
	105.35	1.7(2)	SL			Clay >50%		104, 105		Silty Claystone. Olive gray (5y 4/1) Slightly weathered Slightly friable. Massive bedding Trace carb material, iron staining.
	107	1.6(2)				Clay >50%		106		Same as above becoming very silty toward bottom.
	109.15	1.7(1)				Clay >50%		108, 109		Same as above not as silty as bottom of last interval.
	109.80	.6(1)	SL			Sand >50%				Sandstone. Med Lt gray (N6) Slightly weathered. Slightly friable. Cross bedded (very thin). V. f. g. sand well sorted some silt. Some carb. material
										NO SAMPLE

Begin Box 6 ↓

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 18-87BR

GEOLOGIST(S): LAA
DATE: ~~8/16/89~~ LA 8/17/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 6 of 9	110.0 – 111.0	1.05(1)				Sand >70%		111		Sandstone. Med Lt. gray (N6) Slightly weathered, Slightly friable very thin cross beds vf g sand well sorted Some silt Some siltstone layers
	111.0 – 113.15	1.75(1)				Sand >70%		112		Same as above. Sand vf.g. to med. grained.
	113.15 – 113.4	.25(1)				Silt >50%		113		Siltstone. Olive gray (5y 4/1) Slightly weathered, slightly friable. Thin layered bedding.
	113.4 – 115.0	0						114	X	No Sample
	115.0 – 115.9	.7(1)				Silt >40% Clay >40%		115		Interbedded siltstones + claystones - Claystones olive gray (5y 4/1) Siltstones yellowish gray (5y 5/1). Mod weathered, slightly friable Claystones massive (up to 1 in thick) Siltstones thinly layered
	115.9 – 117.0	0						116	X	No Sample
	117.0 – 117.5	.65(1)				Clay >50%		117		Claystone Olive gray (5y 4/1). Slightly friable, Slightly weathered massive bedding
	117.5 – 118.3	.75(1)				Clay >50%		118		Same as above Some laminar silt layers (thin) @ bottom.
	118.3 – 119.0	1.95(1)				Clay >40% Silt >40%		119		* Interbedded Siltstones + claystone as above Mod weathered, mod friable. Thin laminar bedding Some very fine grained sand
	119.0 – 119.5	.5(1)				"				Same as above
	119.5 ↓					Clay >40% Silt >40%				See next page for description.

Begin Box 7 ↓

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Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

* Markers in this interval indicated this was "x-tra core."

LOG OF BORING NO. 18-87 BR

GEOLOGIST(S): UAA
DATE: 8/17/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 7 of 9	119.5 – 120.0	1.9(2)				Clay >40% Silt >40%		121		Interbedded Siltstone + claystone Clay zones olive gray (5y 4/1) Silt zones pinkish gray 5yr 8/1. mod weathered mod friable Bedding in thin laminated horizontal layers. Some v.f.g very thin (<.5 mm) layers of sand
	121.0 – 123.05	1.8(2)				"		122, 123		Same as above
	123.05 – 124.0	1.95(1)				"		124		Same as above
	124.0 – 124.8	.75(1)				"		125		Same as above
	* 124.8 – 126.7	1.85(2)				"		126		Same as above
	126.7 – 127.0	3(2)				"		127		Same as above
	127.0 – 128.33	1.35(2)			15°-20°	Clay >50%		128		Silty Claystone Olive gray (5y 4/1) Slightly weathered slightly friable Layered bedding Some very thin layers of silt + v.f.g. sand Bedding slightly dipping @ bottom some carb. material toward the top.
	128.33 – 130.1	1.85(2)	SL		30°	← Silt >50% ← Sand ≈40%		129		Sandy Siltstone Olive gray (5y 4/1) to yellowish gray (5y 8/1) Slightly weathered slightly friable Thin layered bedding, uneven Some soft sed. deformation Bedding titled Sand v.f.g

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

* Had to erase to correct diagram.

LOG OF BORING NO. 18-87 BR

GEOLOGIST(S): UAA
DATE: 8/17/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 8 of 9	130.1 – 131.0	1.1 (2)			30°	Sand >50%				Sandstone yellowish gray (5y 8/1). Slightly to mod weathered slightly f.g. Thin layered bedding (<1mm) Sand v f g well sorted some silt some carb material
	131.0 – 131.6	.6 (2)				Sand >50%		131		Same as above
	131.6 – 133.4	1.75 (2)				Silt >50%		132, 133		Siltstone Brownish gray (5yr 4/1) Slightly weathered slightly friable Bedding not evident Some areas of v f.g sand as above Trace carb material
	133.4 – 135.0	1.7 (2)				Silt >50%		134		Same as above
	135.0 – 136.75	1.75 (2)				Silt >50%		135, 136		Same as above w/layers (silty) claystone
Box 9 of 9	136.75 – 139.0	1.9 (2)				Clay >50%		137, 138		Silty claystone Brownish gray (5yr 4/1). Slightly weathered. Slightly friable Bedding not evident. Some areas of very f.g. sandstone (not in horizontal layers)
	139.0 – 139.0	1.8 (2)		30°		Clay >50%		139		Same as above v f g sand in thin (<1mm) layers Bedding tilted but cannot determine extent. Possibly 30° (from weathering)

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 18-87BR

GEOLOGIST(S): UAA
DATE: 8/17/89

PROJECT NO: 667122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	↑ 140.8					Clay 25%				See previous page for description
	142.7	1.85 (1)		30°		Clay 75%		141, 142		Claystone Brownish gray (5yr 4/1) Mod weathered Moderately friable, Bedding not evident. Possibly tilted (from ~~bed~~ weathering. Some iron staining. Traces of carb material Some silt in matrix
147.0	147.0	2.3 (2)				Clay 75%		143, 144, 145, 146, 147		Same as above Silty claystone @ bottom of interval
								148, 149		Bottom of Boxes

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
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(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 19-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY: DATE: 8/7/89

PROJECT NO: 667-11.22

Top/Depth Box	Top/Depth Core	Sample Number	Recovery (in/%)	USCS Symbol	Fracture Dip	Fracture Azimuth	Bedding Angle	Gross Size Distribution	Depth in Feet	Symbolic Log	LITHOLOGIC DESCRIPTION
0.0	0.0		12(1)	GC				Gravel ≈50% Clay 50%	1		Clayey gravel Gravel Med gray to med dark gray (N5 to N4) Angular to sub angular Mod grading max size 6cm Matrix med brown (5yr 3/4) Silty clay. Low plasticity. Some sand Some surficial roots + grass. Matrix calcareous
	1.4										
	2.0		0						2		No Sample
			22(1)	GC				Caliche >50% Gravel ≈30%	3		gravelly caliche, white (N9), very pale orange (10yr 8/2) to dark yellowish orange (10yr 6/6) Mod. plasticity Sandy. Gravel angular to subrounded max size 3cm Mod grading. Short interval (≈ 3 in) Clayey v coarse grained sand lt brown (5yr 5/6) well sorted subrounded Calcite stringers (Near top)
	3.9										
	4.0		0						4		
			1.7(1)	GC				Caliche 40% Clay 20% Gravel ≈39%	5		Same as above More clay No sand interval.
	5.3										
			65(1)	GC				Gravel >50%	6		Clayey Gravel. Predom. Med. gray (N5). Angular to sub rounded. Mod grading max size 6cm Matrix Sandy clay med brown (5yr 4/4) Sand fine to granules
	6.0		0						7		No Sample
	8.1								8		
	8.1 to 11.1		2.9(1)	GC				Gravel ≈30 Clay ≈30 Caliche ≈30	9		Same as above lg amount of caliche present

Box 1 of 2

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core wedges cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 19-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:
DATE: 8/7/89
PROJECT NO: 667-11.22

USCS SYMBOL

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROCK (IN FEET)	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
11.1	8.1 to 11.1								11		See description on previous page
11.1	11.1		3.0 (2)	CL				Clay >50% Silt ≈30%	12, 13		Silty clay. yellowish gray to dark yellowish orange. (5y 8/1 to 10yr 6/6) Mod plasticity some carb. material some caliche in areas
	14.1								14		
16.1	14.1		2.9 (1)(2) LA	CL				Clay >50% Silt ≈48%	15, 16		Same as above
	16.1								17, 18, 19		Bottom of Boxes

Boxes 2 of 2

Begin Box 2

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 20-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): UAA
DATE:
CHECKED BY:
DATE: 7/31/89
PROJECT NO: 667-11.22

Box 1 of 7

TOP/BOTTOM OF CORE IN BIT	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE RECOVERED	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0 0	0.0 to 1.85		1.8 (1)	GC				50% gravel 50% Clay 50% gravel 40% 60% Caliche	1		Clayey Gravel Light gray (N7), predominant gravel color. Angular to sub-rounded Moderately well graded Max size 5cm. Clay matrix brownish gray (5yr 4/1) Some sand + silt, Some surficial roots, Some CaCO3 Grades to caliche matrix less gravel at bottom of interval
	2.0 to 4.0		1.8 (1)	GC				60% gravel 40% matrix	2, 3		Gravel in caliche matrix Medium gray (N5). Angular to sub angular well graded Max size 9.5 cm Some sand in caliche matrix Grades to some clay in caliche matrix toward bottom. Light brown (5yr 5/6)
	4.0 to 5.9		1.7 (1)	GC				50 40% gravel 60% matrix	4, 5		Same as above
	5.9 to 6.4		.7 (1)	GC					6		Same as above, less caliche, CaCO3 More brown clay matrix.
	6.4 to 8.8		1.1 UA 0						7, 8		No Sample
	8.8 to 10.8		1.1 (1)	GC				Gravel 50% Matrix 50%	9		Gravel Very pale orange (10yr 8/2) to Light gray (N7) Angular to subrounded well graded Max size 4.5 cm. Sandy clay matrix Lite brown (5yr 5/6) Matrix ≈ 30% coarse sand. Some CaCO3 still present

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 20-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY: DATE: 7/31/89

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE (in ft. from ground surface)	SAMPLE NUMBER	FEET OF CORE (NOT INTERVAL) USCS Symbol	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 7	10.8						GC				Same as above
	10.8 to 11.8			1.9 (1)			GC		11		Same as above No $CaCO_3$ seems to be present
11.8 ↓	11.8 to 13.8		CL	1.9 (1)				Clay 90%	12, 13		Clay Dark yellowish orange (10yr 6/6) to Light brown (5yr 5/6) mod to high plasticity Horizontal bedding w/some carbonaceous material Some gravel becoming silty, Very pale orange (10yr 8/2) toward bottom of interval Begin Box 2
	13.8 to 15.8		CL	2.5 (1) ~~1.9~~ (1)				Clay 60% Silt 40%	14, 15		Silty Clay Very pale orange to dark yellowish orange (10yr 8/2 to 10yr 6/6) Moderate to high plasticity Bedding appears horizontal Some areas of matrix appear to be iron stained. Trace carbonaceous material
Box 2 of 7	15.8 to 18.8		CL	~~1.3~~ (1) 3.1 (1)					16, 17, 18		Same as above
↑ 20.3	18.8 to 20.8		CL	1.9 (1) ~~3.1~~					19		Same as above Silt content fluxuates 10% ~~[illegible]~~ either way

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 20-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): UAA
DATE:
CHECKED BY:
DATE: 7/31/89 UA

USCS symbol

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION	
↑ 20.8	20.8			CL						Silty clay as above	
20.8 ↓	25.8	SL	3.3 (2)	CL			Clay 70% Silt 30%	21, 22, 23		Silty Clay Very pale orange to light brown (10yr 8/2 to 5yr 5/6) Moderate plasticity Iron staining vertical infractured Some carbonaceous material. Trace gravel Silt content fluxuates throughout interval by 30% Some areas 70% silt (one area ≈ 2 in long).	20.8 Begin Box 3 ↓
	23.8 ~~25.8~~ 23.8 ↓	SL	2.4 (2)	CL				24, 25		Same as above	
	25.8 25.8	SL	3.3 (2)	CL				26, 27, 28		Same as above	
↑ 28.8	28.8										
28.8 ↓ Box 4 of 7	28.8 to 30.8		2.3 (2)	CL		Clay 75% Silt 25%		29		Silty clay Grayish orange to Dark yellowish brown (10yr 7/4 to 6/6) Moderately high plast Some carbonaceous material Some vertical fractures 2 Hollow geode like ~~[illegible]~~ 1" Trace CaCO3 nodules (vacuole)	Begin Box 4 ↓

Box 3 of 7

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 20-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): CAA
DATE:
CHECKED BY:
DATE: 7/31/89
PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE INTERVAL	SAMPLE NUMBER	FEET OF CORE RECOVERED	USCS symbol	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 4 of 7	30.8 ↑										
	30.8 ↓ to 33.8 ↑		3.6 (2)	CL				Clay 75% Silt 25%	31, 32, 33		Same as above. Some pale yellowish orange brown (10yr 6/2) toward bottom $CaCO_3$ stringers present Iron staining Didn't see any nodules
33.8	33.8								34		No Sample
34.7 ↓	34.7 ↑ to 36.7	SL	2.5 (1)	CL				Clay 80% Silt 20% Clay 70 Silt 30	35, 36		Silty clay Dark yellowish orange to very light gray (10yr 8/2 to N8) Moderate to high plasticity Becoming siltier at bottom
Box 5 of 7	~~39.7~~ CA 36.7 to 39.7 ↑	SL	3.9 (2)	CL				Clay 70% Silt 30% Clay 95% Silt 5%	37, 38, 39		Silty clay. Dark yellowish orange (10yr 6/6) Yellowish gray (5y 7/2) Some iron staining Trace gravel. Becoming less silty and Light brownish gray (5yr 6/1) toward bottom of interval.
	39.7 ↓										See next page

~~33.8 to~~ 34 Begin Box 5 ↓

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 20-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY: DATE: 7/31/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE RECOVERED	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 5 of 7	39.7 to 41.7	I	2.5 (2)	CL				Clay 90% Silt 10%	41		Silty Clay Dark yellowish orange to yellowish gray (10yr 6/6 to 5y 7/2). Iron staining in some vertical fractures Silt content fluxuates by 10%
41.7 ↓	41.7 to 44.7		1.8 (1)					Clay 90% Silt 10%	42, 43, 44		Claystone. Dusky yellow (5y 6/4) to Light brownish gray (5yr 6/1). Highly weathered Slightly to moderately ~~weathered~~ friable Some silt. Some iron staining
	44.7 to 46.7		2.7 (2)					Clay 70% Silt 30%	45, 46		Silty Claystone Brownish gray (5yr 4/1) to grayish orange (10yr 7/4) Highly weathered Moderately friable. Vertical heavily iron stained fracture Bottom 1.7 ft
Box 6 of 7 ↑	46.7 to 49.7		4.3 (1)					Clay 95% Silt 5%	47, 48, 49		Claystone. Same as above Silt content fluxuates ≈ 20% upward toward bottom of ~~core~~ interval

Begin Box 6 ↓

Begin Box 7 ↓

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 20-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:
DATE: 7/31/89
PROJECT NO: 667-11.22

USCS symbol

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
49.7 Box 7 of 7 ↓ 51.7	49.7 to 51.7		3.0(1)					Clay 95% Silt 5%	51		Claystone, Light olive gray to olive gray (5y 6/1 to 5y 4/1). Highly weathered Highly friable Slightly silty. Weathered somewhat horizontally Possibly due to bedding
									52		Bottom of Boxes

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 20-87BR

PAGE 1 OF

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD
DATE:
CHECKED BY:

DATE: 8/8/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FOOT	SAMPLE NUMBER	FEET OF CORE	USCS symbol	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
50.0 ↓	50.0 TO 52.0		1.55 (2)						51		Silty Claystone-lt. gray (N7), massive bedding, well weathered, mod. friability, trace of carb. material & iron staining as mottles.
	52.0 TO 54.0		0						52, 53, 54		NO SAMPLE
	54.0 TO 55.5		ND						55		same as above
	55.5 TO 56.5		1.6 (2)						56		same as above
	56.5 TO 58.0		ND						57		same as above
	58.0 TO 59.75		ND						58, 59		same as above
↑ 59.75											
59.75 ↓											

BOX 1 of —

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 20-87BR

PAGE 2 OF

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD
DATE:
CHECKED BY:

USCS symbol

DATE: 8/8/89

PROJECT NO: 667-11.22

Depth in feet	Top/bottom of core in box	Sample number	Feet of core	Fractures per foot	Fracture angle	Bedding angle	Grain size distribution	Depth in feet	Lithologic log	Lithologic description
	59.75 TO 61.45		ND					61		Siltstone - lt gray (N7); massive bedding; sh weathered, slightly friable some carb. material & clay, becoming clayeyer at bottom 0.5 ft of interval
	61.45 TO 63.1		ND					62		Silty claystone - olive gray (5Y 4/1) massive to wavey bedding, weathered slightly friable, V.F.G sand & silt are interbedded throughout, trace of carb material
	63.1 TO 64.9		ND					63, 64		Same as above; trace of iron staining as mottles
	64.9 TO 65.95		ND					65		Same as above; some carb. material & iron staining.
	65.95-66		0					66		No sample
	66-66.25		ND							Same as above
	66.25 TO 68.0		ND					67		Same as above
68.0	68.0 TO 69.7		ND					68, 69		Silty claystone - olive gray (5Y 4/1) to very lt gray (N8), well weathered, V.F.G sand & silt laminea are bedded vertically, mod. friable, some carb material & iron staining as mottles
	69.7-70.0		0							No sample

Box 2 of 9

Box 3 of 9

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 20-87BR

PAGE 3 OF

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD/[illegible]
DATE: [illegible]
CHECKED BY:
DATE: 8/8/89
PROJECT NO: 667-11.22

Top/Bottom of Core in Box	Top/Bottom of Core in Feet	Sample Number	Feet of Core	Fractures per Foot	Fracture Angle	Bedding Angle	Drilling Size Distribution	Depth in Feet	Lithologic Log	Lithologic Description
Box 3 of 9	70.0 TO 71.6		ND					71		Silty Claystone - olive gray (5Y 4/1) to very lt. gray (N8), V.F.G. sand & silt laminea are bedded vertically to nearly vertical, mod. friable, trace of carb. material & iron staining as mottles.
	71.6 TO 72.8		(2) 1.8					72		Same as above
	72.8 TO 74.0		(2) 1.5					73		Same as above; vertical laminea is no longer present. (massive bedding?) Silt occures in pockets.
↑ 75.6	74.0 TO 75.6		ND					74 75		Same as above; lt. olive gray (5Y 6/1), interval becomes more carb. at the bottom. ~~of the~~
75.6 ↓ Box 4 of 9	75.6 TO 77.3		ND				>50' Clay	76 77		
	77.3 TO 78.5		ND				>50' clay	78		
	78.5 TO 79.5		(2) 0.8				>50' clay	79		
	79.5 - 80.85		ND				>50 clay			

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 20-87BR

PAGE 4 OF

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD/[illegible]
DATE: 8/8-9/89
CHECKED BY:

USCS symbol

DATE: 8/8/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN BOX	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	DECIDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
BOX 4 of 9	79.5 TO 80.85		ND					>50' clay			
	80.85 TO 82.85		(2) 1.7			+0°		>50' clay	81, 82		As above with slickensides at 81.5 ft. +0° angle and decrease in carbonate mineralization
	82.85 TO 84.5		(2) 1.45					>50' clay	83, 84		
84.5	84.5 to 86.4		ND					>50' clay	85, 86		
	86.4 to 87.6		ND						87		
	87.6 to 88.0			0					88		No Sample
	88.0 to 88.4		ND								
	88.4 to 90.2		ND						89		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

Very interval blocks for 82011 + 780 are out of place and [illegible] the end of the box

LOG OF BORING NO. 20-87 BR

PAGE 5 OF

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 9/7/9
CHECKED BY:
DATE:

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN BOX	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Bot 50 ft ↑	85.4 to 90.2		ND					>50 clay			As above
	90.2 to 92.0		ND						91		
	92.0 to 93.65		ND						92		Increase in silt [illegible] below 92.0 ft.
									93		
93.65	93.65 to 96.0		0						94		No Sample
									95		
									96		
	96.0 to 97.4		ND					>50 clay	97		Silty Claystone 1 ft (N7) bioturbated, soft sediment deformed, well weathered, moderately friable, some carbonaceous mineralization disseminated throughout
	97.4 to 9.0		ND						98		
	9.0 to 0.7		ND						99		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 20-87

PAGE 6 OF

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 8/14/89
CHECKED BY:
DATE:

USCS symbol

PROJECT NO: 667-11.22

Top Depth of Core in Box	Top Depth of Core in Box (Ft. Below Ground)	Sample Number	Feet of Core	Fractures per Foot	Fracture Angle	Bedding Angle	Grain Size Distribution	Depth in Feet	Lithologic Log	LITHOLOGIC DESCRIPTION
	99 to 100.7		N/D				>50' clay			As above
101.7	100.7 to 101.7		N/D					101		
			0					102		SLUFF
102	102.0 to 103.75						>50' clay	103		As above (reference interval 96.0 to 101.7 ft), with localized iron staining below 103 ft., bedding not apparent
	103.75 to 105.0							104		
	105.0 to 105.5		N/D					105		
	105.5 to 107.3							106		
	107.3 to 108.7							107		
	108.7 to 109.0							108		
	109.0 to 110.7							109		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 20-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCK
DATE: 3/9/89
CHECKED BY:
DATE:

USCS symbol

PROJECT NO: 667-11.22

Top/Bottom of Core in Box	Top/Bottom of Core (Depth)	Sample Number	Feet of Core	Fractures per Foot	Fracture Angle	Bedding Angle	Drain Size	Depth in Feet	Lithologic Log	Lithologic Description
Box 1 of 9 118.3	109.3 to 110.3		ND				>50' Clay			As above
113.3	110.3 to 112.0		ND					111		
	112.0 to 113.0		ND					112		
	113.0 to 113.7 OCD		ND					113		
	113.7 to 115.4		ND					114		
Box 2 of 9	115.4 to 117.0		ND		45° slick			115		Slickenside occurs at ~115.7 ft ~45°
	117.0 to 118.8		ND		~90°			116		As above with decrease in OCD's & H fraction from ~117.4 to 118 ft.
118.8	118.8 to 121		ND					117		Slickenside occurs at ~118.2 ft. vertical orientation.
								118		
								119		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 20-27

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCD
DATE:
CHECKED BY: DATE:

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN BOX (FT)	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	DECIMAL ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	118.2 to 121		ND					>50% Clay			As above
	121 to 122.5		ND						121		
	122.5 to 122.8		ND						122		
	122.8 to 124.6		ND						123		
	124.6 to 126.2		ND						124		
									125		
									126		
									127		Bottom of Box 9 of 1 at 126.2 ft

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 21-87

GEOLOGIST(S): DCB
DATE: 8/11/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0 0	0.0 to 1.9					>50% Gravel	GC	1		Clayey Gravel, light gray (N7), clay matrix is medium light gray (N6), angular to subangular, poorly graded, max. size 5 cm, some plant debris in upper .15 ft., some silt, trace of sand, calcareous mineralization disseminated throughout clay matrix
1.9 to 2.0										NO SAMPLE
	2.0 to 3.0					>50% Gravel	GC	2		As above (reference interval 0.0 to 1.9 ft), clay matrix is med dark gray (N4).
	3.0 to 4.3	0						3		No Sample
	4.0 to 4.3					>50% Gravel	GC	4		As above (reference interval 0.0 to 1.9 ft.).
	4.3 to 7.0	0						5, 6		No Sample
	7.0 to 7.3	ND				>50% Clay	CL	7		Clay, light gray (N7), low to medium plasticity, some gravel from 7.0 to 7.4 ft, trace of calcareous mineralization.
	7.3 to 8.9	ND				>50% Clay		8		Claystone, light gray (N7) to medium dark gray (N4), bedding not apparent, highly weathered, highly friable, some iron staining, local DCB carbonaceous mineralization.
	8.9 to 9.5	ND						9		
	9.5 to 10.6	ND				>50% Clay	CL			Clay, light olive gray (5Y 5/2), moderately high plasticity, localized calcareous

Box 1 of 2 DCB

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 21-87

GEOLOGIST(S): DCB
DATE: 8/11/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 2 top	9.5 to 10.6	ND				>50% clay	CL			bodies
Box ↑ 12.0	10.6 to 12.0	ND						11		
12.0 ↓ Box 2 of 2	12.0 to 14.5	ND						12, 13, 14		claystone, medium light gray (N6), bedding not apparent (massive?), highly weathered, moderately friable, iron staining occurs on fracture surfaces, localized carbonaceous mineralization.
	14.5 to 17.0	ND						15, 16		
↑ 17.0	17.0							17, 18, 19		Bottom of Hole Box 2 of 2 at 17.0 ft.

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 22-87

GEOLOGIST(S): DCB
DATE: 8/14/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 to 1.1					>50% Gravel	GC	1		Clayey Gravel, light gray (N7), clay matrix is dark yellowish brown (10 YR 4/2), subrounded, moderately graded, max size 5 cm, some roots and plant debris, some silt, trace of sand
	1.1 to 2.2	0						2		No Sample
	2.2 to 2.6					>50% Gravel	GM			Silty Gravel, light gray (N7), angular, poorly graded, max. size 3 cm., some clay and calcareous mineralization
	2.6 to 3.85					>50% clay		3		Below 2.6 ft. interval is Sandy Gravelly Caliche, white (N9), max. gravel size is 4 cm.
	3.85 to 4.2	0						4		No Sample
1 of 3	4.2 to 5.95					>50% Clay		5		Sandy Gravelly Caliche, white (N9), some clay, max. gravel size is 7 cm.
	5.95 to 6.35					>50% Clay	CL	6		Sandy gravelly Clay, grayish orange (10 YR 7/4), low plasticity, calcareous mineralization
Bot	6.35 to 7.2	0						7		No Sample
	7.2 to 8.8					>50% Gravel	GC	8		Sandy Gravel, medium dark gray (N4), matrix is light brown (5 YR 5/6), angular to subangular, moderately graded, max size 4 cm., some clay and silt.
	8.8 to 9.3							9		
	9.3 to 9.7	0								No Sample
	9.7 to 10.6	0								No Sample

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. DH 22-89

GEOLOGIST(S): DCB
DATE: 8/14/89

PROJECT NO: 667-122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 ↑ 10.6	9.7 to 10.6	0								No Sample
10.6 ↓	10.6 to 11.95	ND				>50% Gravel	GC	11		As above (reference interval 7.2 to 8.9 3 ft),
	11.95 to 12.2	0						12		No Sample
	12.2 to 13.8	ND				>50% Gravel	GC	13		As above (reference interval 7.2 to 9.3 ft.), max gravel size 6 cm with increase in overall size of gravel
	13.8 to 14.7	0						14		No Sample
	14.7 to 16.45	ND				>50% Gravel	GC	15, 16		As above (reference interval 7.2 to 9.3 ft.), gravel is finer as coarsest interval 12.2 to 13.8.
	16.45 to 17.2	0						17		No Sample
	17.2 to 18.8	ND				>50% Gravel	GC	18		As above (reference interval 7.2 to 9.3)
	18.8 to 19.7	0						19		No Sample
	19.7 to 20.7	.3(1)				>50% Clay				Clay stone, light gray (N7), bedding not apparent, highly weathered

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO: BH 22-87

GEOLOGIST(S): DCB
DATE: 8/14/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	19.7 to 20.7	(1) .3				>50% clay				moderately friable, possible mg oxides (exhibits dendritic morphology), 1 cobble, trace sand + gravel
2 of 3	20.7 to 22.2	0						21, 22	X	No Sample
Box ↑ 23.7	22.2 to 23.7	(1) .35						23		As above (reference interval 19.7 to 20.7 ft.), cobble, sand and gravel are absent, local iron staining
23.7 ↓	23.7 to 24.7	(1) 26						24		As above with ~~color change~~ DCB ~~to~~ DCB ~~opaque~~ dark mineralization occurring locally but lacking a dendritic morphology.
3 of 3	24.7 to 26.0	ND						25		
Box ↑ 27.2	26.0 to 27.2	ND						26, 27		Abundant iron staining at 26.5
								28, 29		Bottom of Box 3 of 3 at 27.2 ft

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 22-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): UAA
DATE:
CHECKED BY: DATE: 8/3/89

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN FEET	TOP/BOTTOM OF CORE IN FEET (Sandy, Clayey)	SAMPLE NUMBER	FEET OF CORE RECOVERED	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	Grain size or % fines	DEPTH IN FEET	GRAPHIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 to 2.0		1.85(1)	GC				Grav. >50%	1		Gravel matrix color Moderate yellowish brown (10yr 5/4). Gravel subangular to subrounded mod well graded (Sand size 3.5 mm). Clay matrix Low plasticity. Sand med grained primarily Becoming less gravelly toward bottom Color darker + more mottled (Dark yellowish brown (10yr 4/2). calcitic
	2.0 to 3.5		1.5(1)	GC					2, 3		Same as above.
	3.5 to 4.0		0						4		No Sample
	4.0 to 6.0		1.75(1)	CL				Clay >50%	5		Gravelly clay. Pale brown (5yr 5/2). Est. mod high plasticity. Some sand Trace calcite. Gravel subrounded small to very large Max size 7 cm Some moderate yellow (5y 7/6) mottling toward bottom
Box 1 of 7	6.0 to 7.4		1.6(1)	CL				Clay >50%	6, 7		Clay. Dark yellowish brown (10yr 4/2) to dark yellowish orange Slightly Silty Trace gravel Slightly calcitic Est. plast. mod. to high. Trace very ferrous material mineralized (about 1 in x 10 in plate
	7.4 to 8.0		.6(2)	CL				"			Same as above
	8.0 to 9.0		.9(1)	CL				"	8		Same as above with some color change in areas to Grayish brown (5yr 3/2). These darker areas have traces of organic material and or [illegible] very small
9.0	9.0 to 10.2		1.6(1)	CL				Clay >50% Silt >20%	9		Silty Clay Yellowish gray (5y 8/1) to Dk. yellowish orange 10yr 6/6 Traces of the darker gray (10yr brown (5yr 3/2) clay from above Trace small rounded gravel Slightly calcitic. Est plast-Mod.

Begin New Box

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 22-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): VAA
DATE:
CHECKED BY:
USCS & symbol
DATE: 8/3/89
PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE RECOVERED	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BORING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 7	10.2 to 11.8	~~1.8~~	1.8(1)	CL				Clay >50% Sand >10%	11		Same as above
	11.8 / 12.2		.3(2)	CL					12		Same as above
	12.2 to 13.2		~~.3~~(2) 1.4	CL					13		Same as above Some subrounded lg. gravel-max 6.5cm
	13.2 to 14.2		~~1.4~~ 1.1	CL					14		Same as above but without gravel
	14.2 to 15.0		~~1.1~~ .7	CL					15		Same as above, ~~more~~ higher silt content larger areas of dark yellowish orange coloring
	15.0 to 16.2		1.6	CL					16		Same as above. Siltier at top of interval less silt toward bottom
Box 3 of 7	16.2 to 17.6		1.75	CL				Clay >80%	17		Clay, lt. brownish gray (5yr 4/1) Est. plasticity moderate Slightly silty in some areas Trace root material — Begin Box
	17.6 to 18.2		.75	CL					18		Clay Same as above Some dk. yellowish orange 10yr 6/6 mottling.
	18.2 to 19.0		1.0	CL					19		Clay. Same as above. Some calcareous nodules
	19.0 to 20.2		1.7	CL							Clay Same as above some calcareous nodules Claystone at very bottom of interval.

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 22-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): UAA
DATE:
CHECKED BY:

USCS symbol

DATE: 8/3/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FOOT	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 3 of 7	20.2 to 22.0		1.8 ~~1.85~~ ~~1.4~~ LA					Clay >80% ↓	21		Claystone. Lt. olive gray (5y 6/1). Massive bedding. Highly weathered. Moderately friable. ~~Some~~ Silt. Some Dark yellowish orange (10yr 6/6) mottling
	22.0 to 22.2	2	.4					↓	22		Same as ~~able~~ LA above
	22.2							↓			No Sample
overlap	to		1.2					↓	23		Same as above some areas slightly siltier.
	24.0		1.6					Clay >80%	24		Claystone Lt olive gray (5y 6/1) Possible horizontal bedding. Highly weathered Moderately friable. Silty in areas.
Box 4 of 7	25.5		1.6					Clay >80% ↓	25		Same as above
	26.5		1.55					↓	26		Same as above Some ironstaining Some fractures w/mineralization.
	27.5		1.45					↓	27		Same as above More mottled.
	27.7		4					↓			Same as above
	28.5		1.7						28		Same as above.
28.5 Box 5 of 7	29.5		1.65					Clay >70% Silt ≥10%	29		Silty claystone. Light olive gray (5y 5/2) to Dk. yellowish orange. (10yr 6/6) Horizontal bedding. Highly to extremely weathered moderately to highly friable. Begin Box 5
	29.5 to 30.5		1.5								Same as above

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(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 22-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:
DATE: 8/3/89

PROJECT NO. 667-11.22

Sample Type	Sample Depth	Recovery	RQD	Blows/6"	OVA	Graphic Log	Water Level	Water Loss	USCS	Depth	Graphic Log	LITHOLOGIC DESCRIPTION
Box 5 of 7	30.5			.4					Clay 75% Silt 20% Sand 5%			Silty claystone. Same as above.
	30.9			1.4						31		
	31.5			1.4								
	31.8			.9								
	32.5			.9 .85						32		Same as above. Appears less weathered possibly due to more massively bedded intervals. Some areas of very heavy iron staining.
	33.0			.85						33		
	33.5			.85								
20.0	34.0			1.0						34		Same as above, heavily weathered again. Some black carbonaceous material.
Box 6 of 7 *	34.5			.8					Clay 70% Silt 20% Sand 10%			Silty claystone. Yellowish gray (5Y 7/2) Bedding. Highly weathered. Healed fractures. (within staining) Some carbonaceous material. Begin Box 6
	35.0			1.0						35		Same as above.
	35.5			.9								Same as above
	35.8			.9								
	36.5			1.0						36		Same as above
	37.5			1.1						37		Silty claystone. Olive gray (5Y 4/1). Bedding not apparent. Weathered. Slightly friable. Trace sand
	38.5			2.1						38		Silty claystone. Yellowish gray (5Y 7/2). Bedding not apparent. Highly weathered. Healed fractures. Some iron staining. Some carbonaceous material
	39.5			1.75					Clay 75% Silt 25%	39		Silty Claystone. Brownish gray. (5YR 4/1) to grayish orange (10YR 7/4) Layered bedding. Probably horizontal. Highly weathered, moderately friable. Common black carbonaceous material, usually between layers
				1.75*								

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(1) Badly broken core, accurate footage measurement not possible.
(2) Core barrel cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

* It was marked on box that @ 36.5 there was 1.2 ft of "reworked" core in box

LOG OF BORING NO. 22-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:

USCS symbol

DATE: 8/3/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN DEG	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 7 of 7	40.5										
	41.5	1	1.6					Clay >80% Silt ≥10%	41		Silty Claystone. Brownish gray (5yr 4/1) to grayish orange (10yr 7/4) Layered Bedding probably horizontal Highly weathered moderately friable. Common black carbonaceous material, usually between layers
	42.5		1.9					↓	42		Same as above
43.5	43.5		1.7 +9					↓	43		Same as above
									44		Bottom of Boxes
									45		
									46		
									47		
									48		
									49		

Box -

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
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ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 22-87 BR

PAGE OF

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
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CHECKED BY:

USCS symbol

DATE: 7/28/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FRACTURE	SAMPLE NUMBER	FEET OF CORE IN BOX	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
									41		
41.1	41.1 to 45.1		0.4 (1)					Clay 80% Silt 20%	42, 43, 44, 45		Claystone Olive gray (5y4/1). Massive bedding. Weathering moderate. Slightly friable. Some silt. Trace carbonaceous material. Some iron staining in horizontal and vertical fractures. Trace. $CaCO_3$ (very weak HCL reaction) Begin Box 4 ↓
	45.1 to 49.45	SL	3.8 (1)					Silt 90% Clay 10%	46, 47, 48, 49		Siltstone Yellowish gray to light olive gray (5y 8/1) to (5y 6/1). Moderately weathered. Slightly friable. Massive bedding. Some iron staining. Some clay. Grades back into claystone (as 41.1 to 45.1 above) Slickensides present in fractures.
	49.45 ↓										

Box 4 of 10

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
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ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 22-87 BR

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DATES DRILLED:
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PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE RECOVERED	FEET OF CORE LOST	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 4 of 10	49.45 to 52.5	SL	2.5 LA, 2.2 (1)			90° + 40° from Vert			51, 52		Claystone. Light brownish gray to brownish gray (5yr 6/1 to 5yr 4/1). Massive bedding. Slightly friable. Some silt. Trace carbonaceous material. Some slickensides visible in fractures. Trace iron staining.
	52.5 to 54.5	SL	(2) 1.9						53, 54		Same as above.
Box 5 of 10	54.5 to 56.5	SL	1.9					Clay 80% Silt 20%	55, 56		Claystone. Light Olive gray (5y 6/1) Massive bedding. Weathered. Slightly friable. Some silt. Some carbonaceous material. Some iron staining. Begin Box 5
	56.5 to 60.5		3.7 (2)			20° from Vert.			57, 58, 59		Same as above. Slightly more friable. Some slickensides visible in fractures. Grades to darker (Olive gray 5y 4/1) to Olive black (5y 2/1) Claystone. More weathered. Moderately friable. Weathered in platey layers. Some carbonaceous material. Trace very fine grained sand. Becoming more carbonaceous. Trace coal.

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ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 22-87 BR

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PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE (INCHES)	USCS SYMBOL ~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 5 of 10	60.5										
	60.5 to 64.5		3.6 (2)						61, 62, 63, 64		Claystone. Olive gray to olive black (5y 4/1) to (5y 2/1). Massive bedding. Highly weathered. Moderately friable. Weathered in thin plate layers 1-2 mm. Some areas of abundant carbonaceous material. Silty in upper 1 ft. of interval. Trace iron staining.
Box 6 of 10	64.5 to 68.5	SL	3.1 (2)			10° off vert.			65, 66, 67, 68		Claystone. Olive gray (5y 4/1) massive bedding. Moderately weathered. Slightly friable. As above in to 1 in. of interval ~~less~~ Some carbonaceous material. Not as abundant as above. Trace ~~some~~ ironstaining. Becomes very hard, non-friable at bottom of interval. Very ~~stained~~ stained on outside of core. Healed fracture (carbon)
	68.5 to 70.5		2.35 (2)			60° off vert.			69		Claystone. Olive gray (5y 4/1) massive bedding. Mod weathering. Slightly friable. Abundant carbonaceous material. Slickensides present in fracture

Begin Box 6

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ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 22-87 BR

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TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 6 of 10	70.5 to 72.5		1.85 (1) UA ~~2.35~~						71, 72		Claystone As above interval Vertical fracture w/slickensides
	72.5 to 74.5		1.85 (1)						73, 74		As above.
74.5	74.5 to 76.5		1.7 (2)			25° from Vert			75, 76		Claystone. Light olive gray to olive gray (5y 4/1-2/1) Begin Box 7 Massive bedding Moderate weathering Slightly friable. Some carbonaceous material Some slickensides in fractures
Box 7 of 10	76.5 to 78.5		3.7 (1)						77, 78		Same as above except highly weathered. Friable. Olive gray to olive black (5y 2/1) to (5y 4/1). No slick's. visible
	78.5 to 80.5		1.85 (1)						79		Same as above Slightly less weathered, less friable More carbonaceous material.

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ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 22-87 BR

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DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
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PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROCK (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 7 of 10	80.5										
	80.5 to 81.5	SL	.85					Silt 20% Clay 80%	81		Silty claystone Brownish gray to olive gray (5yr 4/1 to 5y 4/1) Moderately weathered Slightly friable. Abundant carbonaceous material.
82.5	81.5 to 82.5	SL	.90					Silt 40% Clay 60%	82		
82.5	82.5	SL	1.8(1)				20°		83		Silty claystone. Same as above but with less carbonaceous material. Grades to Siltstone. Light olive gray. (5y 6/1) Weathered Slightly friable. Very thin parallel bedding.
	84.5								84		Grades to very fine sandstone Color - same, weathered ~~Sto~~ moderately friable well sorted with thin layers of claystone (1 in. thick)
Box 8 of 10	84.5		2.0(2)				20°		85		Top .7 ft. Interbedded Siltstones, claystones + very fine grained sandstones. Light olive gray (5y 6/1) to Olive gray (5y 4/1) S.S. + Siltstn layers ≈ 1 in thick. Claystn. .5 in thick Possible load casts in clay layers SS layers, well sorted weathered. Moderately friable Lower portion fine grained silty sandstones as above
	86.5								86		1st. ≈ .5 ft Sandstone light olive gray moderately weathered. Slightly to non friable Fine to med grained well sorted Calcareous Cement ~~Grades through~~ rest of interval interbedded to Claystone, siltstone + sandstone Horizontal bedding Sharp contacts Some possible crossbedding
	86.5 to 88.6	SL	1.8(2)						87		
									88		
	88.6 to 90.5		.6(2)						89		Claystone Olive gray (5y 4/1) Slightly weathered Slightly friable Trace iron staining

Begin Box 8 ↓

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ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 22-87 BR

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DATES DRILLED:
ELEVATION:
GEOLOGIST(S): UAA
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CHECKED BY: DATE: 7/28/89

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PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE RECOVERED	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 8 of 10	90.5									
	90.5 to 93.3		2.75 (2)					91, 92, 93		Claystone Olive gray (5y 4/1) Slightly weathered to weathered in places. Bedding angle changed abrubtly to ≈50° off horizontal. At very btm of interval sharp contact with med grnd. ss (contact at 53°) Some possible load casts in claystone. Very thin (1-2 mm) coal seam visible
93.3 ↓	93.3 to 94.5		.9 (1)					94		Claystone. Brownish gray (5yr 4/1) Massive bedding over interval. Slightly weathered slightly friable. Begin Box 9 ↓
	95.0		0							No Sample
Box 9 of 10	95.0 to 99.0		4.3 (1) ~~9 (2)~~					95, 96, 97, 98, 99		Same as above interbedded lenticularly with med grained silty sandstone, same color. Horizontal thin layers from 1-2mm to 8 cm thick. Also some siltstone layers.
	99.0 ↓ to 101.0		1.8 (1)							Same as above.

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ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 22-87 BR

PAGE OF

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY: DATE: 7/28/89

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE RECOVERED	FEET OF CORE LOST	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 9 of 10	101.0								101		
	101.0 to 102.0		1.8(1)						102		No Sample
	102.0 to 104.0	SL	1.8(1)			50°			103		Claystone. Brownish gray (5y 4/1). Massive bedding. Moderately weathered. Slightly friable. Abundant black carbonaceous material. Silty. Some fractures
104.0	104.0 to 107.0		3.5(1)						104, 105, 106		Claystone. Light olive gray (5y 6/1) Massive bedding. Highly weathered slightly to moderately friable. Some carbonaceous material. Begin Box 10
Box 10 of 10	107.0 to 111.0		2.3(1)						107, 108, 109		Same as above. More weathered. Highly friable.

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(1) Badly broken core, accurate footage measurement not possible.
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ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 22-87 BR

PAGE OF

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:

USCS symbol

DATE: 7/28/89

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (IN FACTS)	SAMPLE NUMBER	FEET OF CORE IN BOX	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
↑ 111.0	↑ 111.0			CL					111		See previous page
									112		Bottom of Boxes
									113		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 23-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD
DATE:
CHECKED BY:
DATE: 8/1/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (FT/FT/FT)	SAMPLE NUMBER	FEET OF CORE	USCS SYMBOL	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 TO 1.2		0.75 (1)	CL			>50% V F.G. & less	1		F.G. sandy, silty clay - dark yellowish brown (10YR 4/2) - estimated low plasticity, some gravel, trace of roots, max gravel size ≈ 4 cm
	1.2 TO 2.0		0							No Sample
	2.0 TO 2.4		0.3 (1)	GC				2		Sandy gravel - variegated predominantly light brownish gray (5YR 6/1), angular to subangular, mod well graded max size = 3cm, some silt + clay.
	2.4 TO 3.35		.85 (1)	GC				3		Same as above w/ max. gravel size = 5.5cm
	3.35 TO 6.0		0	–				4, 5		No Sample
	6.0 TO 6.5		0.2 (1)	GP				6		Gravel - predominantly pinkish gray (5YR 8/1), angular to subangular, poorly graded, max size ≈ 8cm some sand
	6.5 TO 7.5		0.55 (1)	GP				7		Same as above; subrounded max size ≈ 6.5cm, less sand
	7.5 TO 8.0		0	–				8		No Sample
	8.0 TO 9.2		1.55 (1)	CL				9		Silty clay - lt gray (N8), trace of limonit staining as mottles, calcite (top of interval) & organic matter, estimated mod. high plasticity
	9.2 TO 10.0		1.0 (1)	CL						Same as above

Box 1 of 2

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH23-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD
DATE:
CHECKED BY:
DATE: 8/1/89
PROJECT NO: 667-11.22

USCS symbol

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
10.4	10.0 TO 10.4		0.5 (1)							Silty claystone - pinkish gray (5YR 8/1), some iron staining & organic mater, vertical fractures present.
10.4 Box 2 of 2	10.4 TO 11.95		10 (2)					11		Silty claystone light gray (N7) massive bedding, weathered some limonite staining as mottles & in fractures, trace of organic staining.
12.5	11.95 TO 12.5		0.5 (2)					12		Same as above
										BOTTOM OF BOXES
								13		
								14		
								15		
								16		
								17		
								18		
								19		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 23-87 BR

PAGE 1 OF 1

GEOLOGIST(S): [illegible]
DATE: 8/30/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 -15	ND 1.6				60% GRAVEL 25% SAND 15% CLAY		1		TOP 1 FT CLAY SANDY GRAVEL, dark yellowish brown (10 YR 4/2), angular-subangular, mod grading, max size = 5 cm, abundant calc material. Bottom of interval CALICHE, moderate orange pink (5 YR 8/4), some gravel & sand, broken-up texture. ERASED [illegible]
	1.5-20	Ø						2		NO SAMPLE
	2.0 -34	ND 1.5				70% GRAVEL 30% CALC		3		CALCAREOUS GRAVEL, moderate orange pink (5 YR 8/4), angular-subangular, mod grading, max size = 5 cm, some sand
Box 1 of 4	34-49	(1) 1.3				60% GRAVEL 20% CALC 20% CLAY		4		Same as above; max size = 7 cm, bottom of interval as dark yellowish orange (10 YR 6/6), some clay
	49-60 5.4	Ø						5		NO SAMPLE
	54 -60	~~(1)~~ 0.9				SAME AS ABOVE		6		Same as above some clay ERASED [illegible]
	60 -70	~~Ø (1) 0.9~~						7		
↑ 8.7	70 -8.7	ND 1.6						8		Same as above.
END OF BOXES								9		

NOTES: General USCS is modified for this log as follows.
Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 23-87BR

PAGE OF

GEOLOGIST(S): DCB
DATE: 11/22/89

PROJECT NO: 667-11

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
								11		
								12		
								13		
								14		
								15		
								16		
								17		
								18		
19.0 ↓ Box 3/6	19.0 to 21.0	2.0				25% Silt 70% vfg Sand 5% clay		19		Silty Sandstone, very pale orange (10 YR 8/2) to grayish orange (10 YR 7/4), bedding not apparent, weathered, moderately

NOTES General: USCS is modified for this log as follows.
Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 23-87 BR

PAGE OF

GEOLOGIST(S): DCB
DATE: 11-22-89

PROJECT NO: 667-11

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	19.0 to 21.0	2.0				~25% silt ~70% fg sand ~5% clay		21		friable, v.fine grained, rounded, trace of clay, silt fraction increases with depth.
	21.0 to 23.0	1.66						22		
								23		
6	23.0 to 25.0	1.9'				~90% fg sand ~10% silt		24		Sandstone, grayish orange (10 YR 7/4), bedding not apparent, weathered, mod. friable, f.g. to m.g., trace of silt, sub-rounded to rounded
30	25.0 to 27.0	1.9'						25		
								26		Silty Sandstone (reference interval 19.0 to 23.7 ft.).
20	27.0 to 29.0	1.9'						27		
								28		
29.0								29		

NOTES General. USCS is modified for this log as follows.
Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 23-87 BR

(Box 2 of 4 only)

PAGE 1 OF 2

GEOLOGIST(S): [illegible]

DATE: ~~8/2~~ 9/1/89

PROJECT NO: [illegible]

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
								1		
								2		
								3		
								4		
								5		
								6		
								7		
								8		
								9		
90 ↓ Box 2 of 4	90-96	1.1				60% SAND 40% GRAVEL			0.0 0.0	GRAVELLEY SAND, matrix color is moderate orange pink (5 YR 8/4), angular-subangular, mod quartz, max grain size = 6 cm, sand is FG-CG, some clay ~~CALCAREOUS~~
	96-115	~~1.0~~								NO SAMPLE

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 23-87 BR

GEOLOGIST(S): JAY
DATE: 9/1/89

PROJECT NO: [illegible]

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 4		Ø								NO SAMPLE
	110-112.5	1.0				100% GRAVEL		11		GRAVEL, matrix color is light brown (5 Y/R 5/6), angular - subangular, max size = 6 cm (artificial), some sand, some clay
	112.5 -130	Ø						12		NO SAMPLE
	130 -147	1.8						13, 14		SANDY GRAVEL, matrix color is light brown (5 Y/R 5/6), subangular - subrounded, mod - well graded, max size = 6 cm, some clay as mottles
	147-150	Ø						15		NO SAMPLE
	150 -170	1.9				60% CLAY 40% SAND		16		VFG-FG SANDY CLAYSTONE, non-apparent bedding, well weathered, mod-highly friable, some iron staining as mottles, some silt, trace of Mn staining
	170 -190	1.9				55% CLAY 45% SAND		17, 18		Same as above: increased sand fraction, clayey texture
↑ 190								19		
NO OTHER BOXES FOUND										

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 23-87 BR PAGE 1 OF 2

GEOLOGIST(S): DCB
DATE: 9/1/89

PROJECT NO: 667-11.22

Erasures 9/1/89, DCB corrected interval error

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
								21		Core Begins at
								22		~24.0 Ft.
								23		
24.0								24		
24.0 ↓	24.0					70% vfg sand ~30% silt		25		silty sandstone grayish orange (10 YR 7/4), DCB to v. light gray (N8), bedding not apparent to thin bedded (≤ 4mm), highly weathered, moderately friable, very fine grained, moderately sorted
		(1)						26		
Box 4	to	2.0						27		
								28		
								29		
	31.0									

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 23-87 BR

GEOLOGIST(S): DCB
DATE: 9/1/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	24.0 to 31.0	(1) 20								silty Sandstone as above
Box 4/	31.0 to 33.0	ND						31		
								32		
								33		silty Sandstone as above with thin beds of silty claystone at ~ 32.8 ft.
								34		Bottom of Box 4/ at 33 ft.

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 23-87 BR

PAGE 1 OF

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 7/28/89
CHECKED BY: DATE:

USCS symbol

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROCK (INTERVAL)	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
31.4 ↓ Box 1 of 2	31.4 to 33.4	GS	ND					>50' silt	31, 32, 33		Siltstone, dark yellowish orange (10YR 6/6), bedding ~~10° dip less than 1mm thick~~ DCB not apparent, highly weathered, slightly friable, localized iron staining, trace of fine sand. At 32.5 ft. (est. depth), tan strata of siltstone, white (N9) are bedded at 10° and are less than 1mm thick
	33.4 to 35.0		0						34, 35		NO Sample
	35.0 to 35.5		(2) .8					>50' silt	35		As above (reference interval from 31.4 to 33.4), with irregular lenses of the white siltstone.
	35.5 to 36.0		ND						36		
	36.0 to 36.7		ND								
	36.7 to 37.0		ND						37		
	37.0 to 38.0		ND					>50 clay	38		Claystone, medium gray (N5), bedding not apparent, highly weathered, moderately friable, localized iron staining.
↑ 39.3	38.0 to 39.3		ND						39		
39.3 ↓ Box 2 of 2	39.3 to 40.3		(1) >1.0								

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 23-87 BR ?

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 7/28/89
CHECKED BY: DATE:

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE (USCS symbol)	FEET OF CORE IN BOX	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	39.3 to 40.3		>10 (1)					>50% clay			As above
	40.3 to 42.3		ND						41, 42		
Box 2 of 2	42.3 to 43.3		ND						43		Claystone, olive gray (5Y 4/1), bedding appears flaky with ~10° dip based on core break, weathered, moderately soft, localized iron staining and carbonaceous mineralization.
	43.3 to 44.3		ND						44		
	44.3 to 45.3		ND						45		
45.3	45.3								46		Bottom of Box 2 of 2 at 45.3

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 24-87

DATES DRILLED:
ELEVATION
GEOLOGIST(S): DCD
DATE: 7/26/89
CHECKED BY: DATE:

USCS symbol

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FOOT (in 1/10 ft.)	SAMPLE NUMBER	FEET OF CORE IN BOX (NEBOL 1/10 ft.)	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 to 1.3		ND	GW			>50% Gravel	1		Clayey Gravel, very light gray (N8), light gray (N7), grayish red (10 R 4/2), well graded, max. size 5 cm., some silt and sand
	1.3 to 2.0		0							No Sample
	2.0 to 3.3		ND	GW			>50% Gravel	2, 3		As above (0.0 to 1.3 ft. interval), clay matrix color changes to moderate brown (5 YR 3/4), gravel decreases in size, max size 3 cm.
	3.3 to 4.0		DCB ~~ND~~ 0							No Sample
	4.0 to 5.0		ND	SP			>50% Sand	4		Gravely Sand, grayish orange pink (5 YR 7/2), fine to coarse grained, subrounded to rounded, moderately sorted, some silt and carbonate (minor), strong reaction with dilute HCl.
	5.0 to 6.0		0					5		No Sample
	6.0 to 7.30		ND	SP GP				6, 7		As above (4.0 to 5.0 ft interval), a very coarse gravel fraction (max. size 6 cm) occurs at 6.7 ft. (est.) and continues to 7.30. Gravel, medium gray (N5) angular to subrounded, moderately graded, some sand & carbon
	7.30 to 8.50		ND	SP GP				8		As above (6.0 to 6.7 ft interval) with color change to grayish orange 10 YR 7/4 at 7.8 ft. A coarse gravel fraction 6 cm max size occurs from 7.8 to 8.50 - see description above gravel
	8.50 to 9.30		0					9		No Sample
	9.30 to 10.10		ND	SP GP						As above (7.3 to 7.8 ft interval) with decrease in size of gravel fraction, max size 4 cm.

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 24-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S) DCB/GCE
DATE: 7/26/89
CHECKED BY: DATE:

USCS symbol

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE RECOVERED	USCS SYMBOL	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
10.10 Bottom of Box 1	10.10 to 11.10		NO SAMPLE					11		NO SAMPLE
11.10 Top of Box 2	11.10 to 12.10		ND	SP				12		As above (9.34 to 10.10)
	12.10 to 13.10		N.D.					13		NO SAMPLE
	13.10 to 13.4		NO SAMPLE							
	13.4 to 15.10		N.D.					14		clayey S. Mstone, grayish orange (10 YR 7/4), bedding not apparent, highly weathered, highly friable, localized bodies of dark orange mineralization and localized iron staining, ~~slight gravel fragments~~ DCB single gravel clast surrounded 5 cm at 14.8 ft.
	15.10 to 16.80		ND					15, 16		At 16.1 ft color changes to dark yellowish orange (10 YR 6/6), otherwise, as above.
	16.80 to 17.10		NO SAMPLE					17		NO SAMPLE
Bottom of Box 18.30	17.10 to 18.30		N.D.					18		As above (17.1 to 18.30 ft. interval), at 18.1 ft. an isolated body of iron and possible mg oxide minerals occurs.
								19		Bottom of Box

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 24-87

GEOLOGIST(S): DCB
DATE: 8/14/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 to 1.7	(1) 1.0				>50% Gravel	GC	1		Clayey Gravel, light gray (N7), clay is dusky brown (5YR 2/2), subangular to subrounded, poorly graded, max size 6 cm., some roots and plant debris, some silt.
	1.7 to 2.0	0						2		No Sample
	2.0 to 3.3	(1) .7				>50% Gravel	GC	3		As above (reference interval 0.5 to 1.7 ft.)
	3.3 to 4.0	0						4		No Sample
	4.0 to 4.9	ND				>50% Gravel	GC			Gravel, med. light gray (N6), subangular to subrounded, poorly graded, max size 7cm. some sand and silty clay at the base of this interval.
	4.9 to 7.5	0						5, 6, 7		No Sample
	7.5 to 7.8	ND				>50% clay		8		Claystone, very pale orange (10 YR 8/2), bedding not apparent, highly weathered, moderately friable, iron staining on fractures and as mottling, calcareous mineralization on fractures and dark mineralization on fractures and possible bedding plane partings.
	7.8 to 9.4	ND						9		
	9.4 to 10.0	ND								

Box 1 of 2

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 24-87

GEOLOGIST(S): DCB
DATE: 8/14/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
10.75	10.0 to 10.75	0								No Sample
10.75 ↓ Box 2 of 2 ↑ 12.3	10.75 to 12.3					>50% clay		11, 12		As above (reference interval 7.5 to 10.0 ft), without calcareous mineralization.
								13, 14, 15, 16		Bottom of Box 2 of 2 at 12.3 ft

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 25-87

DATES DRILLED:
ELEVATION
GEOLOGIST(S) LAA
DATE
CHECKED BY.
DATE 7/25/89
PROJECT NO. 667-11.22

USCS symbol

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (interval)	SAMPLE NUMBER	FEET OF CORE IN BOX (interval)	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0 0 ↓	0 0 ↓ to ↑ 1.65		N/D (1)	CL			Clay >50%	1		Slightly silty clay Grayish brown (5yr 3/2). Highly plastic Some sand + surficial roots and grass. Trace gravel (to 2 8cm)
			0					2		No Sample
	2 0 ↓ to ↑ 3 95		(1) N.D.	CL			Clay >50%	3		Slightly silty clay Moderate yellowish brown (10yr 5/4) Trace sand and surficial roots. Trace gravel. (up to 1cm.) Moderate to high plasticity
	3 95 to 7.0		0					4 5 6		~~Clay~~ LA No Sample
Box 1 of 2	7 0 to 8 85		(1) 15	GW			Gravel >50%	7 8		Clayey Gravel Gravel grayish orange pink to medium gray (10R 8/2 to N5) Angular to subrounded. Well graded Maximum size 75 cm Clay matrix Moderate reddish brown Some sand Trace calcareous materials (slight reaction)
			.25					9		Single Cobble - mid Dk gray (N4) Sub angular Some clay and sand attached
	9 0 to 9 5		0							No Sample
↑ 16 3	9.5 to 10.4		.35				Gravel 100			Two cobbles - Same as above

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

Bkg βγ: 50-150 cpm
Box βγ: 50-200 cpm

N.D. = No discrepancy

LOG OF BORING NO. 25-87

DATES DRILLED
ELEVATION
GEOLOGIST(S) LAA
DATE
CHECKED BY.
DATE 7/25/89
PROJECT NO. 667-11.22

USCS symbol

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTACTA)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTACTA)	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 2	9.5 to 10.4		.35						Gravel 100%		Two gravel cobbles Medium dark gray Subangular Some Sandy clay attached.
	10.4 ↓ to ↑ 14.5		0						11, 12, 13, 14		No Sample
			0								No Samples
↑ 16.3	14.8 ↓ to ↑ 16.3		1.2 (1)	CL				Clay >50%	15, 16		Clay Light olive gray (5y 6/1). Medium to high plasticity Some silt Trace iron staining and carbonaceous material.
new box ↓ 16.3 ↓ Box 2 of 2	16.3 to 17.3		1.2 (1)	CL				Clay >50%	17		Same as above but with more iron stains. New Box ↓
											NO SAMPLE
	17.6 to 19.3		1.1 (1)	CL				Clay >50%	18, 19		Same as above but slightly more silt. Medium plasticity
	19.3 to 19.8		1.0 (1)	CL				Clay >50%			Silty clay Very pale orange to grayish orange (10yr 8/2 to 10yr 7/4) Med to high plasticity. Some iron staining throughout and in cracks.
	19.8 to 20.5		0								No Sample

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

Bo-Box: 50-100 cpm

LOG OF BORING NO. 25-87

DATES DRILLED:
ELEVATION
GEOLOGIST(S): LAA
DATE
CHECKED BY:
DATE: 7/25/89
PROJECT NO. 667-11.22

USCS SYMBOL

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (in feet)	SAMPLE NUMBER	FEET OF CORE IN BOX (in feet)	~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	19.8 to 20.5		0							No Sample
Box 2 of 2	20.5 to 21.85	LA ~~1.9~~	1.9	CL			Clay 75%	21		Silty clay very pale orange to grayish orange (10yr 8/2 to 10yr 7/4) ~~Some~~ Medium to high plasticity ↖ To light olive gray (5y 6/1) Some iron staining in fractures
22.5	21.85 to 22.5	LA ~~1.5~~	1.5	ML			Clay 75%	22		Clayey silt very pale orange to grayish orange (10yr 8/2) Med to high plasticity
								23		Bottom of Boxes

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

βγ Box: 50-100 cpm

LOG OF BORING NO. BH 25-87

GEOLOGIST(S): [illegible]
DATE: 9/5/89

PROJECT NO: [illegible]

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
[illegible]	[illegible]	(1) 1.5				80% CLAY 20% SAND	CL	1		SANDY CLAY, dusky yellowish brown (5 YR 2/2), mod - high plast, some silt some roots, trace of gravel
	1.5 [illegible]	∅						2		NO SAMPLE
	2.0 -3.95	(1) 1.5					CL	3		SILTY CLAY, mod yellowish brown (10 YR 5/4) est mod plast, some sand, trace of gravel
	3.95 -7.0	∅						4 5 6 7		NO SAMPLE
	7.0 -8.85	(1) 1.5				75% GRAVEL 25% CLAY	GC	8		CLAYEY GRAVEL, top matrix color is greyish orange (10 YR 7/4), middle is moderate brown (5 YR 4/4) and bottom is moderate yellowish brown (10 YR 5/4) Subangular-subrounded, mod-poorly graded, max size = 8 cm, some sand, base of interval is slightly calcareous
	[illegible]	0.2(1)				85% GRAVEL 15% CLAY		9		Same as above
	90.95	∅								NO SAMPLE
	95.[illegible]	0.4(1)				90% GRAVEL 10% CLAY	GC			GRAVEL, matrix color is mod yellowish brown (5 YR 4/4), [illegible] poor gradg, max size = 7 cm, some [illegible] (interval contains 2 pieces of gravel w/ clay adhered to gravel)

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. [illegible]

GEOLOGIST(S): [illegible]
DATE: 2/5/89

PROJECT NO: [illegible]

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
										See previous page
Box 1 of 2	10.4 -14.5	0						11, 12, 13, 14		NO SAMPLE
	14.5-14.8	0								NO SAMPLE
1.3	14.8 -16.3	(1) 1.3						15, 16		[illegible], light gray (N8), non-[illegible] bedding, very highly weathered, mod & highly friable, flaming texture, non staining apparently along [illegible] microfractures and as mottles, some silt
16.3	16.3 -17.3	(1) 1.2						17		Same as above
	17.3-17.6	0 (1)								Same as above / Some sand
	17.6-19.3	(1) 1.2						18, 19		Same as above
	19.3 -19.8	1.2								SILT / CLAYSTONE, grayish yellow (5 Y 8/4) non-apparent bedding, well weathered, mod friable
	19.3-20.3	0								NO SAMPLE

Smellon staining as mottles and along microfractures

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 25-97

GEOLOGIST(S): DAY
DATE: 9/5/89

PROJECT NO: 667-122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
										NO SAMPLE [illegible]
Box 2 of C	20.5 - ~~25.2~~ 22.5	(1) 1.9						21, 22		SILTY CLAYSTONE grayish yellow (5Y 8/4) [illegible] non-apparent bedding, well weathered, unodifiable, iron staining as matrix and along micro fractures, some VFG sand flowing texture
25.2	22.5 - 25.2	(1) 1.5						23, 24, 25		Same as above
End of Boxes								26, 27, 28, 29		

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 25 87-BC

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD / DAT (USCS symbol)
DATE:
CHECKED BY: DATE: 8/7/87

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE RECOVERED	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE OF CLASTICS	DEPTH IN FEET	STRATIGRAPHIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓ Box 1 of 4	00 -22		(1) 1.65	GC					1, 2		CLAYEY GRAVEL - MATRIX COLOR - MOD BROWN (5 YR 3/4), ANGULAR TO SUB-ROUNDED, WELL GRADED, MAX SIZE = 4.5 cm, SOME SAND, TRACE OF ROOTS
											TOP 4 IN., SAME AS ABOVE.
	22 -5.5		(1) 1.65	GC					3, 4, 5		CALCAREOUS SANDY GRAVEL - MATRIX COLOR WHITE (N9) TO GRAYISH ORANGE (10 YR 7/4), ANGULAR TO SUB-ANGULAR, MOD-WELL GRADED, MAX SIZE = 6 cm, SOME CLAY.
	55 -7.5		(1) 1.95	CL					6, 7		SANDY CLAY - MATRIX MOD ORANGE PINK (5 YR 8/4), MED PLASTI, SOME GRAVEL, FLOURY TEXTURE. BOTTOM 8 IN BECOMES CALCAREOUS ~~CLAYEY GRAVEL~~ CLAYEY GRAVEL, MOD ORANGE PINK (5 YR 8/4), ANGULAR - SUBROUNDED, POORLY GRADED, MAX SIZE = 6 cm.
	75 -9.5		(1) ~~.85~~ 1.2	GC					8, 9		CLAYEY GRAVEL - MOD ORANGE PINK (5 YR 8/4), ANGULAR, MOD GRADED, MAX SIZE = 6.5 cm, SOME SAND AND CALCAREOUS MATERIAL
	9.5 -10.5		(1) 1.2	CL							SANDY CLAY - MATRIX GREYISH ORANGE (10 YR 7/4), LOW PLASTICITY, SOME GRAVEL

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core wedges cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 25 87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD/DAT
DATE:
CHECKED BY:
DATE: 8/7/89

USCS symbol

PROJECT NO: 667-11.22

Top/Bottom of Core in Box	Top/Bottom of Core in Hole	Sample Number	Feet of Core	Feet of Core	Fractures per Foot	Fracture Angle	Bedding Angle	Grain Size Distribution	Depth in Feet	Lithologic Log	Lithologic Description
↑ 10.5											SLIGHTLY CALCAREOUS.
10.5 ↓	10.5 -12.5		(1) 1.0	CL					11		CLAYEY GRAVEL - LIGHT BROWN (5 Y 6/4) ANGULAR - SUB-ANGULAR, MOD GRADING MAX SIZE = 6.5 CM, SOMETAND, SLIGHTLY CALCAREOUS
									12		
	12.5 -14.5		(1) 1.65						13		SANDY GRAVELY CLAY - GREYISH ORANGE (10 YR 7/4), ANGULAR - SUBANGULAR, MOD GRADING, MAX SIZE = 6 CM, TOP 1/2 OF INTERVAL ~~IS MORE~~ HAS FLOURY TEXTURE, BOTTOM 1/2 IS MORE COHESIVE.
									14		
	14.5 -16.5		(1) 1.9						15		SAME AS ABOVE
									16		
	16.5 -18.5		ND						17		MG SANDY CLAY - VERY PALE ORANGE (10 YR 8/2) ~~MOD ORANGE PINK (5 YR 8/4)~~, MOD PLAST, IRON STAINING, SLIGHT FLOURY TEXTURE
									18		BOTTOM 1 FT OF INTERVAL - CLAYEY SANDSTONE, VERY PALE ORANGE (10 YR 8/2), MASSIVE BEDDING, WELL WEATHERED, MF-G, SUB-ANGULAR - SUB-ROUNDED, ~~WELL~~ MOD SORTED, SILICA CEMENTED, CALCAREOUS STREAK IN TOP OF BOTTOM 1 FT
	18.5 -19.5		(1) 1.55						19		SAME AS ABOVE W/ CARB MATERIAL, IRON STAINING, BECOMING ~~INCREASINGLY~~ HEAVLY IRON STAINED AT BOTTOM OF INTERVAL
	19.5 -23		(1) 1.05								SANDSTONE - VERY PALE ORANGE (10 YR 8/2) TO DARK YELLOWISH ORANGE (10 YR 6/6), MASSIVE

BOX 2 OF 4

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 25-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD/DAT
DATE:
CHECKED BY: DATE: 8/7/89

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FOOT (FT. BELOW)	SAMPLE NUMBER	FEET OF CORE (INCHES)	FEET OF CORE (INCHES)	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 4 → 22									21		BEDDING, WELL WEATHERED, MOD FRIABLE, VFG - FG, WELL SORTED, SILICA CEMENTED
22 ↓	22-23		ND						22		VFG-MG SANDSTONE - VERY PALE ORANGE (10 YR 8/2) TO DARK YELLOWISH ORANGE (10 YR 6/6), MASSIVE BEDDING, HIGHLY WEATHERED, MOD FRIABLE, SUBANGULAR TO SUBROUNDED, MOD SORTED, SOME SILT, IRON STAINING
	23-24		ND						23		SILTY SANDSTONE, VERY PALE ORANGE (10 YR 8/2) TO DARK YELLOWISH ORANGE (10 YR 6/6), NON APPARENT BEDDING, HIGHLY WEATHERED, MOD - HIGHLY FRIABLE, VFG - MG, SUBANGULAR - SUBROUNDED, MOD SORTED, SOME CLAY, IRON STAINING
Box 3 of 4	24-26		~~(1)~~ ~~.7~~ ∅						24		NO SAMPLE
	26-28		(1) .7						26		SAME AS ABOVE - NO CLAY
	28-30		(1) 1.1						28		SAME AS ABOVE -

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(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 25-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD/DAT
DATE:
CHECKED BY:

USCS symbol

DATE: 8/7/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 3 of 4	30-32		(1) 1.4						31		MG SANDSTONE - VERY PALE ORANGE (10 YR 8/2) TO DARK YELLOWISH ORANGE (10 YR 6/6), MASSIVE BEDDING, HIGHLY WEATHERED / POOR INDURATED, HIGHLY-M FRIABLE, SUB ANGULAR - SUBROUNDED, WELL SORTED, IRON STAINING, TRACE OF SILT
	32-33		(1) .85						32		SAME AS ABOVE
	33-35		(1) ~~.65~~ .4						33, 34		SAME AS ABOVE
	35-36		(1) .25						35		SAME AS ABOVE - VFG - MG, SILTY, SUBANGULAR TO ROUNDED
	36-38		Ø						36, 37		
	38 38 5		.35						38		SAME AS ABOVE
	38 5 - 407		Ø						39		NO SAMPLE

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 25-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD/DAT
DATE:
CHECKED BY:
DATE: 8/7/89
PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
											NO SAMPLE
Box 3 of 4	40.7 - 42.7		(1) 0.15						41, 42		VFG - MG SANDSTONE, VERY PALE ORANGE (10 YR 8/2) TO DARK YELLOWISH ORANGE (10 YR 6/6), MASSIVE BEDDING, HIGHLY WEATHERED / POORLY INDURATED, HIGHLY - MOD FRIABLE, SUBANGULAR - ROUNDED, MOD SORTED, IRON STAINING, SOME SILT.
44.7	42.7 - 44.7		(1) 035						43, 44		SAME AS ABOVE - CONVALUTED W/ CLAYSTONE
44.7 Box 4 of 4	44.7 TO 46.7		10(1)						45, 46		V.F.G sandy Claystone - mottled lt olive gray (5Y 6/1) & Dark yellowish orange (10YR 6/6), massive bedding, weathered slightly friable.
47.0	46.7 - 47.0		ND						47		silty claystone - lt. gray (N7), massive bedding? slightly weathered, slightly friable, some v.f.G. sand.
											BOTTOM of BOXES
									48, 49		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 26-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:
USCS symbol
DATE: 8/3/89
PROJECT NO: 667-11.22

Top/Bottom of Core in Box	Top/Bottom of Core in Material	Sample Number	Feet of Core Recovered	Fracture Per Foot	Fracture Angle	Boring Angle	Drill Time Per Foot	Depth in Feet	Lithologic Line	LITHOLOGIC DESCRIPTION
0.0	0.0						Gravel 75%			Gravel. ~~Top 6"~~ Predominantly med yellowish brown. (10yr 5/4). Subangular to subrounded. Mod ~~grading~~ sorted. Max size 6.5 cm. Top 4" has dark yellowish brown (10yr 5/4) silt. Rest of interval has very pale orange (10yr 8/2) silt. Floury. Very calcareous. Roots at surface. Trace clay. Surficial grass. CaCO3 mineralization on gravel (rinds)
			.85(1)					1		
	2.0									
	2.0						Silt >50%	2		~~Gravelly Very~~ LAA ~~Silt Pale~~ LAA
			1.7(1)					3		Gravelly silt. Very pale orange (10yr 8/2). Floury texture. Gravel angular: ~~Moderate~~ Angular to sub-angular. ~~Poorly~~ Moderate graded. Max size 6.5 cm. ~~Some~~ LAA Calcareous rinds on gravel. Matrix very calcareous
	4.0							4		
	4.0						Gravel ≥50% Clay 40% Sand 10%			~~Sandy~~ Clayey sandy gravel. Gravel predom med. dark gray (N4). Angular to sub. angular. Mod grading. Max. size 6 cm. Matrix very clayey, very pale orange to grayish orange. (10yr 8/2 to 7/4). Calcitic.
			.9(1)					5		
	6.0									
	6.0						Gravel 40% Clay 50% Sand 10%	6		Same as above. Less gravel, more floury matrix.
			9(1)					7		
	8.0									
	8.0						Gravel 70% Clay 25% Sand 5%	8		Clayey sandy gravel. Gravel predom med dark gray (N4). Angular to subrounded. Well graded. Max. size 5 cm. Clayey sand matrix grayish orange (10yr 7/4). Slightly calcitic
			10(1)					9		
	10.0									

Box 1 of 2

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 26-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:
DATE: 8/3/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 2	10.0 – 12.0		2.0(1)					Gravel >50%, Clay 45%, Other 5%	11		Clayey gravel Gravel predominantly med. gray (N5). Angular to subangular Mod. well graded Max size: 5.5 cm Clay matrix Yellowish gray (5y 8/1). Trace sand + silt Some Caliche, but generally slightly calcitic
	12.0 – 14.0		1.3(1)						12, 13		Same as above Gravel generally smaller more silt. Slightly less cohesive
	14.0 – 16.0		0.5(1)	CL				Clay >90%	14, 15		Clay Pinkish gray (5y 8/1) Mod high plast Some calcite ~~Trace Caliche~~ nodules LAA
Box 2 of 2*	16.0 to 18.0			CL				Clay >90%	16, 17, 18		Same as above, some dark yellowish orange (10yr 6/6) mottling. Silty toward bottom of interval
									19		Bottom of Boxes

Begin Box 2 ↓

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

* According to markers in box, intervals overlap between 14.5 + 16.0 Ft.

LOG OF BORING NO. 27-87

GEOLOGIST(S): DCB
DATE: 8/11/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓ Box 1 of 6	0.0 to 1.5	ND				>50' clay	CL	1		Clay, moderate brown (5 YR 3/4), moderate plasticity some silt and fine gravel, some plant roots and debris in upper - 3 ft.
	1.5 to 3.0	ND						2		Caliche, grayish pink (10 R 8/2), trace of gravel
	3.0 to 4.0	ND						3		As above with increase in the gravel fraction, max. size 4.5 cm
	4.0 to 4.5	ND						4		
	4.5 to 5.0	ND				>50' silt	MH	5		Sandy Silt, light brown (5 YR 6/4) to grayish orange pink 5 YR 7/2), calcareous some gravel, coarse fraction ranges from angular to rounded.
↑ 6.0	5.0 to 5.5	ND				>50' Gravel	GM			
	5.5 to 6.0	ND						6		
6.0 ↓ 2 of 6 Box	6.0 to 6.5	ND								Silty Sandy Gravel, medium gray (N5), silty sand matrix is light brown (5 YR 6/4), angular to subangular, poorly graded, max size 3.5 cm, calcareous matrix with a body of caliche at ~6.0 ft.
	6.5 to 7.55	O						7		
	7.55 to 8.3	ND				>50' Gravel	GM	8		NO Sample As above (reference interval 5.0 to 6.5 ft)
	8.3 to 9.4	O						9		No Sample
	9.4 to 10.1	ND				>50' Clay	CL			Gravely Clay, grayish orange (10 YR 7/4) grading to light gray (N7), low plasticity, abundant silt, some sand

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 27-87

GEOLOGIST(S): DCB
DATE: 8/11/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER (DCB)	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	9.9 to 10.1	ND	~~ND~~			~50% clay	CL			As above
Box 2 of 6	10.1 to 11.29	0						11		No Sample
	11.29 to 11.9	ND	~~ND~~			~40% sand ~40% clay ~20% gravel	CL/SP	12		Gravelly Sand/Clay, light brown (5YR 6/4), low plasticity, calcareous, abundant coarse grained sand 11.8' to 11.9 ft (est) ~~calcareous minerals absent below 11.9 ft.~~ DCB
	11.9 to 12.15	.8(1)	~~.8(1)~~							
	12.15 to 12.2	.8(1)	~~.8(1)~~							
	12.2 to 13.15	0						13		No Sample
	13.15 to 13.4	1.5(1)	~~1.5(1)~~							Clayey Sandy ~~and~~ Gravel, light gray (N7) to medium dark gray (N4) matrix is light brown (5YR 6/4), angular, poorly graded, max size 3.5 cm. some silt.
	13.4 to 14.9	ND	~~ND~~ DCB					14		
14.9	14.9 to 15.15	ND						15		
	15.15 to 16.1	0						16		No Sample
Box 3 of 6	16.1 to 17.2	ND	DCB-3					17		As above (reference interval 13.15 to 15.15), max gravel size 4 cm, slight decreas in clay and sand fraction.
	17.2 to 18.06	0						18		No Sample
	18.06 to 19.1	ND	DCB-4			CL	~50% clay ~30% vfg sand ~20% mg/fg + cg sand	19		Sandy Clay, light brown (5YR 6/4), low, plasticity, trace of gravel
	19.1 to 21.12	ND								

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 27-87

GEOLOGIST(S): DCB
DATE: 8/14/89 11+ DCB

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	19.1 to 21.12	ND				~50% Clay 30' vfg sand 20' fg-mg tcg sand	CL	21		As above
	21.12 to 22.9	ND						22		As above with color change to moderate reddish orange (10 R 6/6), and slight increase in clay fraction
3 of 6 Box	22.9 to 24.9	ND						23, 24		As above with color change to light brown (5 YR 5/6) and some gravel from ~ 23.5 to 23.8 ft (est depth).
8/11/89 ↑ 24.9	24.9 to 26.8	ND				~50% Clay 40% sand 10% Gravel		25, 26		Sandy Clay, light brown, (5 YR 6/4), low plasticity some gravel
8/14/89 ↓ 24.9	26.8 to 28.45	ND						27, 28		
4 of 6 Box	28.45 to 31.9	O						29		No Sample

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 27-87

GEOLOGIST(S): DCB
DATE: 8/14/89

PROJECT NO: 667-1123

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	28.45 to 31.9	0						31		No Sample
Box 4 of 6	31.9 to 33.58	ND				>50% Gravel	GC	32		Sandy Gravel, medium-light gray (N6), matrix is light brown (5 YR 6/4), 4.5 cm max size, angular poorly graded, some clay.
						>50% clay	CL	33		Interval grades to sandy clay, at ~32.3 ft. Sandy Clay, light brown (5 YR 6/4), low plasticity trace of gravel
	33.58 to 34.9	ND				>50% Gravel	GC	34		Interval grades to sandy clayey Gravel at ~34.3 ft. Sandy Clayey Gravel, dominantly light gray (N7), matrix is light brown (5 YR 6/4), angular to subrounded, moderately graded, max. size 3.5 cm.
Box 5 of 6	34.9 to 35.54	0						35		No Sample
	35.54 to 36.9	ND				>50% Gravel	GC	36		As above (reference interval 34.3 to 34.9 ft)
	36.9					>50% clay	CL	37		Interval grades to silty clay at ~36.6 ft. Clay, yellowish gray (5 Y 8/1), silty moderately high plasticity, micaceous, some sand.
Box 5 of 6	36.9 to 38.9	ND				>50% Gravel	GC	38		Interval grades to Sandy Gravel at ~37.5 ft. Sandy Gravel, medium light gray (N6), sand is grayish orange (10 YR 7/4), angular to subrounded, poorly graded, max size ~3.5 cm.
	38.9 to 40.9	ND				>50% clay	CL	39		Silty Clay, grayish orange (10 YR 7/4) moderate plasticity, some gravel, and fine sand.

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 27-87

GEOLOGIST(S): DCB
DATE: 8/14/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	38.9 to 40.9	ND				75% clay	CL			As above
Box 5 of 6	40.9 to 42.9	ND				75% clay		41, 42		Clay stone, very light gray (N8), 3 thy, bedding not apparent, highly weathered, moderately friable, local iron staining, some fine grained sand at ~42.8 ft. At 42.9 ft interval is highly friable, contains some subrounded gravel and appears to be a mixture of weathered clay stone and possible colluvial materials.
	42.9 to 44.9	ND						43, 44		
↑ 45.9	44.9 to 45.9	ND						45		Clay stone, light gray (N7), highly weathered, highly to moderately friable, local iron staining on fracture faces and as irregular mottling, some carbonaceous mineralization. Below 45.9 ft. color grades to light olive gray (5Y 6/1) and carbonaceous mineralization is absent.
45.9 ↓ Box 6 of 6 ↑ 47.4	45.9 to 47.4	ND						46, 47		
								48, 49		Bottom of Box 6 of 6 at 47.4 ft.

bedding not apparent DC

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 27-87

(2 of [illegible] 12, [illegible])

GEOLOGIST(S): [illegible]
DATE: 9/1/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
[illegible]	[illegible]-15	1.6				[illegible]		1		Clayey Gravelly Sand, matrix color [illegible] brown (10 YR 4/2), angular-subangular, mod graded, sand is FG-MG, max gravel size = 7 cm. Some roots in top of interval
	[illegible]	0						2		NO SAMPLE
	[illegible]-35	1.65				80% GRAVEL 50% GRAVEL 45% SAND		3		Gravel, matrix color is dark yellowish brown (10 YR 4/2), [illegible] mod-well graded, max size = 5.5 cm, [illegible] clay, trace of [illegible] interval [illegible] (10 YR [illegible]) [illegible] subangular, mod graded, sand is [illegible]
	35-40	0								NO [illegible]
	40-55	1.0				65% GRAVEL 35% SAND		5		Same as above [illegible] max gravel size = 6 cm
	55-70	0						6		NO SAMPLE
	70-78	[illegible]						7		[illegible] orange (10 YR 8/6), subangular [illegible] poorly graded, max size = [illegible]
	78-90	0						8		NO SAMPLE
	90-97	[illegible]						9		Same as above

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Material amounts are estimated by % volume instead of % weight
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(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

5

LOG OF BORING NO. BH 27-87

GEOLOGIST(S):
DATE:

PROJECT NO:

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	(9.7 - 9.95)	1.0								CLAYSTONE, [illegible]
	10.95 - 11.0	0						11		No [illegible]
↑ 12.7	12.0-12.7	0.7						12		Same as above
								13		
								14		
								15		
								16		
								17		
								18		
								19		

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 27-87

GEOLOGIST(S): DCB
DATE: 8/18/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 to 1.75	ND				>50% Gravel	GC	1		Clayey Gravel, light gray (N7), clay matrix is grayish brown (5 YR 3/2), subangular, poorly graded, max size 6 cm, some sand, silt and roots
	1.75 to 2.0	0								No Sample
	2.0 to 3.5	ND				>50% Gravel	GC	2, 3		As above (reference interval 0.0 to 1.75 ft) with increase in sand fraction below ~ 2.5 ft and corresponding color change in matrix to grayish orange (10 YR 7/4), gravel exhibits angular fraction as well.
	3.5 to 4.0	0								No Sample
Bot 10 ft N	4.0 to 5.55	ND				>50% Gravel	GC	4, 5		Sandy Clayey Gravel, medium light gray (N6), matrix is light brown (5 YR 6/4), angular to subangular, poorly graded, max size 6 cm
	5.55 to 7.0	0						6, 7		No Sample
	7.0 to 7.8	ND				>50% Gravel	GP			Gravel, dominantly medium light gray (N6), subangular to subrounded, poorly graded, max size 6 cm., some sand, trace of clay and silt.
	7.8 to 9.0	0						8, 9		No Sample
	9.0 to 9.9	(1) .5				>50% Gravel	GP			As above (reference interval 7.0 to 7.8 ft.)
	9.9 to 10.0	ND								See Next Page

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Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 27-87

GEOLOGIST(S): DCB
DATE: 8/18/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 2	9.9 to 10.95	ND				>50% clay				DCB Claystone light gray (N7), bedding not apparent, highly weathered, slightly friable, slight silt fraction.
	10.95 to 12.0	0	~~DCB~~					11		No Sample
12.4	12.0 to 12.4	ND				>50% clay		12		As Above (reference interval 9.9 to 10.95 ft.) with mottling grayish orange (10 YR 7/4) from 12.4 to 12.9 (est depth), moderately friable
12.4	12.4 to 14.5	(1) 1.0						13		
	14.5 to 14.4	0.1 (1)						14		carbonaceous mineralization at 14.4 ft.
	14.4 to 14.5	0								No Sample
Box 2 of 2	14.5 to 17.0	ND				>50% clay		15		Claystone light gray (N7), bedding not apparent, highly weathered, slightly to moderately friable, DCB slight silt fraction, abundant iron staining below 16.0 ft.
								16		
17.0	17.0							17		Bottom of Box 2 of 2 at 17.0 ft.
								18		

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Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 2887BR

GEOLOGIST(S): TSD
DATE: 7/19/89

PROJECT NO: 6617-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 to 1.3	1.36				5cm to 2mm =38%, VCG-CG =32%, FINES =30%	GC	1		Sandy Clayey Gravel dominantly medium gray (N5) subangular to rounded, moderately graded, some silt (Clay fraction is pale yellowish brown 10 YR 6/2).
	1.3 to 2.0	0								No Sample
	2.0 to 3.4	(1) 1.7				8 cm to 2mm =45% CG=30% FINES =25%	GW	2, 3		Calcareous Gravel moderate orange pink (5 YR 8/4), angular to subrounded, moderately well graded, some silt, trace of roots
	3.4 to 4.0	0								No Sample
Box 1 of 6	4.0 to 5.0	(1) 1.5				60cm to 2mm =25% VCG to CG=45% MG=15% FINES =15%	SW	4, 5		Gravelly Sand - Grayish orange (10 YR 7/4) angular to subrounded, well graded, some clay + silt.
	5.0 to 6.0	0								No Sample
	6.0 to 7.1	(1) 1.65					SW	6		Same as above
	7.1 to 8.0	0						7		No Sample
↑ 9.8	8.0 to 9.8	(1) 2.4				8 cm to 2mm =60% VCG-CG =20% Fines =20%	GW/GP	8, 9		Sandy Clayey Gravel dominantly light gray (N7) angular to rounded moderately graded, trace of silt.

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible.

This log has been re-copied to include correct graphic lithologic log. CKF

ROCKY FLATS PLANT

FIGURE NO.

B & Background = 50-200 cpm
B & core box 1 = 50-100 cpm
core box 2 = 25-150 cpm

LOG OF BORING NO. 28-87 BR

GEOLOGIST(S): TSD
DATE: 7/19/89

PROJECT NO: 6617-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
10.0 ↓ Box 2 of 5	10.0 to 11.3	(1) 1.2				6cm to 2mm =40% VCG-CG =30% Fines =30%	GC	11		Clayey sandy Gravel predominantly light brownish gray angular to subrounded moderately graded.
	11.3 to 12.0	0								No Sample
	12.0 to 13.3	(1) 1.0					GC	12, 13		Same as above
	13.3 to 13.7	0								No Sample
	13.7 to 15.2	(1) 1.55					GC	14, 15		Same as above
	15.2 to 16.8	(1) 0.9				4.5cm to 1.5cm <5% 1.5cm to 2mm =40% VCG-FG =30% Fines >25%	GC	16		sandy clayey fine gravel predominantly light brownish gray subangular to rounded, moderately well graded.
	16.8 to 17.7	0						17		No Sample
	17.7 to 19.0	(1) 1.6					CL	18		sandy clay - light brown (5YR 6/4) moderately high plasticity some fine to medium gravel
	19.0 to 19.7	(1) 1.6					CL	19		Same as above.

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(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 28-87 BR

GEOLOGIST(S): TSD
DATE: 7/20/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 5 21.3	19.7 to 21.3							21		Same as above
21.3 ↓ Box 3 of 5	21.3 to 25.3	(1) 4.5				>50% is VCG to MG 30% is FINES 20% Gravel	SC GC	22 23 24 25		Clayey sand light brown (5YR 5/6) subangular to rounded, well graded some gravel + silt. At approximately 24 ft. the material becomes much sandier + is predominantly coarse to medium grained The lower 6 inches of this interval is a clayey sandy gravel with the max size being 6 cm. angular to subangular, moderately graded.
Box 3	25.3 to 27.3	(1) 2.2				75% 0.5cm to 2.0cm	GC	26 27		Clayey gravel - predominantly medium gray (N5) clay fraction is grayish orange (10YR 7/4), gravel is angular to rounded moderately graded, max size is ≈5.5 cm., some sand.
↑ 29.3	27.3 to 29.3	(1) 2.2					GC	28 29		Same as above
29.3 ↓	29.3 to 30	(1) 1.28				>50% CG TO FINES	SC/GC			Clayey sand + gravel predominantly light gray (N7) to medium gray (N5) clay fraction is grayish orange (10YR 7/4)

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(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

BG Background = 150-200 cpm
BG Box 3 = 100-200 cpm
Box 4
Box 5

LOG OF BORING NO. 28-87 BR

GEOLOGIST(S): TSD
DATE: 7/20/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 4 of 5	30.1 to 30.6	0								angular to subrounded poor to moderately graded, max size = 4.5cm, some silt. No Sample
	30.6 to 31.8	(1) 1.35				75% CG + VCG	GC SC	31		Top 8/10 ft of interval same as above. This grades into a clayey med to V. coarse sand light brown (5YR 5/6), some fine gravel.
	31.8 to 32.6	0						32		No Sample
	32.6 to 34.3	(1) 2.0				50% is 5.5cm to 0.5cm	SC GW	33, 34		Top 0.7 ft of interval is same as above. This grades into a sandy gravel predominantly light gray (N7) subangular to rounded moderately well graded, max size is 5.5cm. some clay.
	34.3 to 35.3	0						35		No Sample
	35.3 to 36.6	(1) 1.45				50% is 2cm to CG 750% 6cm to VCG	GM GP	36		Gravelly silt grayish orange (10YR 7/4) max gravel size is 2cm, some sand (top 6 in). Sandy gravel, angular to rounded poorly graded, some silt trace of clay.
	36.6 to 37.3	0						37		No sample
	37.3 to 38.7	(1) 1.55				1.5cm to 2mm =75% 6cm to 1cm =50%	GC GC	38		Top 1/2 of interval is a clayey gravel, subangular to subrounded well graded, max size is approx 1.5cm, some sand, bottom 1/2 of interval is a clayey sandy gravel, subangular to rounded, poorly graded, max size is 6cm
	38.7 to 39.3	0				6cm to VCG 750%		39		Same as bottom 1/2 of above interval with an increased amount of sand.
	39.3 to 40.0	(1) 0.85					GC			

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ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 28-87 BR

GEOLOGIST(S): TSD
DATE: 7/20/89
PROJECT NO: 667-11.2

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
40.0 ↓	40.0 to 41.1	(2) 1.55					SC	41		Clayey med to fine grained sand light greenish gray (5 GY 8/1) poorly graded, some V. coarse + coarse grained sand + fine gravel. Trace of dark yellowish orange (10 YR 6/6) staining.
	41.1 to 41.3	0								No Sample
	41.3 to 43.3	(1) 1.80				6.5cm to 1cm 75%	GP	42 43		Sandy Gravel Predominantly light gray (N7) subangular to subrounded, moderately graded, trace of clay (grayish orange (10 YR 7/4)) max gravel size = 6.5 cm.
	43.3 to 43.5	0.3					GP			Same as above
	43.5 to 44.5	0						44		No Sample
	44.5 to 45.5	0						45		No Sample
	45.5 to 46.6	1.05					—	46		Claystone yellowish gray (5 Y 7/2) massively bedded, well weathered moderately friable, trace of carbonaceous + medium grained sand inclusions
	46.6 to 47.0	0.38					—	47		Claystone light gray (N7) massively bedded, well weathered, highly friable, iron oxide staining within fractures, trace of carbonaceous staining
	47.0 to 49.0	(2) 2.09						48		Same as above with friability decreasing with depth.
	49.0 to 50.0	0.94						49		Same as above less friable less iron staining, increase in carbonaceous material (coal + leaves ?) + color is medium light gray (N6)
↑ 50.0										

Box 5 of 5

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
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ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 28-87BR

DATES DRILLED
ELEVATION
GEOLOGIST(S) TSD
DATE
CHECKED BY

USCS symbol

DATE 7/19/89

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 TO 1.3		1.36	GC				5 cm TO 2 mm = 38% VCG TO CG = 32% Fines = 30%	1		Sandy clayey gravel dominantly medium gray (N5) subangular to rounded, moderately graded, some silt. (clay ~~is~~ fraction is pale yellowish brown (10YR 6/2)).
	1.3 TO 2.0		0						2		NO Sample
	2.0 TO 3.4		1.7(1) ~~0.2~~	GW				8 cm TO 2 mm = 45% CG = 30% Fines = 25%	3		Calcarious Gravel moderate orange pink (5YR 8/4), angular to subrounded, moderately well graded, some silt, trace of roots.
	3.4 TO 4.0		0						4		NO Sample
BOX 1 of 1	4.0 TO 5.0		1.5(1)	SW				6 cm TO 2 mm = 25% VCG TO CG = 45% MG = 15% Fines = 15%	5		Gravelly Sand - Grayish orange (10YR 7/4) angular to subrounded, well graded, some clay & silt.
	5.0 TO 6.0		0						6		No Sample
	6.0 TO 7.1		1.65(1)	SW					7		Same as above
	7.1 TO 8.0		0						8		No Sample
↑ 9.8	8.0 TO 9.8		2.4(1)	GW/GP				8 cm TO 2 mm = 60% VCG TO CG = 20% Fines = 20%	9		Sandy Clayey Gravel dominantly light gray (N7) angular to rounded moderately ~~sorted~~ graded, trace of silt.

NOTES General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

βγ Background = 50-200 cpm
βγ CORE BOX 1 = 50-100 cpm
Core BOX 2 = 25-150 cpm

LOG OF BORING NO. 28-87BR

DATES DRILLED
ELEVATION
GEOLOGIST(S)
DATE
CHECKED BY DATE 7/19/89

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	USCS symbol ~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
10.0 ↓	10.0 TO 11.3		1.2 (1)	GC			6cm TO 2mm = 30% VCG, TCG = 30% Fines = 30%	11		Clayey sandy gravel predominantly light brownish gray ~~sub~~angular to subrounded, moderately graded
	11.3 TO 12.0	C	0					12		No Sample
	12.0 TO 13.3		1.0 (1)	GC				13		Same as above
	13.3 TO 13.7		0							No Sample
	13.7 TO 15.2		1.55 (1)	GC				14 15		Same as above
BOX 2 of 3	15.2 TO 16.8		0.9 (1)	GC			4.5cm TO 1.5cm <5% 1.5cm TO 2mm =40% VCG TO FG=30% Fines >25%	16		Sandy clayey fine gravel predominantly light brownish gray subangular to rounded, ~~well sor~~ moderately well graded.
	16.8 TO 17.7		0					17		No Sample
	17.7 TO 19.0		1.6 (1)	CL				18		Sandy & Clay - light brown (5YR 6/4), moderately high plasticity Some fine TO medium gravel
	19.0 TO 19.7		1.6 (1)	CL				19		same as above

NOTES General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 28-87 BR

DATES DRILLED
ELEVATION
GEOLOGIST(S) TSD
DATE
CHECKED BY
DATE 7/20/88

USCS symbol

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (interval)	SAMPLE NUMBER	FEET OF CORE IN BOX (interval)	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 21.3	19.7 TO 21.3							21		Same as above
21.3 ↓ Box 3 of 4	21.3 TO 25.3		4.5 (1)	SC GC		750% ~~of~~ is VCG Tan Mg 30% is Fines 20% Gravel		22 23 24 25		Clayey sand light brown (5YR 5/6) subangular to rounded, well ~~sorted~~ graded some gravel & silt. At approximately 24 ft the material becomes ~~increa~~ much sandier & is predominantly coarse to medium grained. The lower ~~1/4~~ 6 inches of this interval is a clayey sandy gravel with the max size being 6cm. angular to subangular, moderately ~~sorted~~ graded.
	25.3 TO 27.3		2.2 (1)	GC		750% ~~of~~ 0.5cm TO 2.0cm		26 27		Clayey gravel - predominantly medium gray (N5) clay fraction is grayish orange (10YR 7/4), gravel is angular to rounded moderately graded, some sand. Max size is ≈ 5.5cm.
↑ 29.3	27.3 TO 29.3		2.2 (1)	GC				28 29		Same as above
29.3 ↓	29.3 TO 30.1		1.28 (1)	SC/GC		750% CG TO Fines				Clayey sand & Gravel predominantly light gray (N7) to medium gray (N5) clay fraction is grayish orange (10YR 7/4)

NOTES General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

Bg Background = 150-200
Bg Box 3 = 100-200 cpm
Box 4 = 100-200 cpm
Box 5

LOG OF BORING NO. 28-87BR

DATES DRILLED
ELEVATION
GEOLOGIST(S) TSD
DATE
CHECKED BY
DATE 7/20/89
PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (interval)	SAMPLE NUMBER	FEET OF CORE IN BOX (interval)	USCS symbol ~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 4 of 5	30.1 TO 30.6		0							angular to subrounded poor to moderately graded some silt. max size = 4 scm. NO Sample
	30.6 TO 31.8		1.35 (1)	GC SC			750% CG + VCG	31		TOP 8/10 of interval of foot same as above. This grades into a clayey med to v coarse sand light brown (5YR 5/6), some fine gravel
	31.8 TO 32.6		0					32		No Sample
	32.6 TO 34.3		2.0 (1)	SC GW			500% is 5.5 cm to 0.5 cm	33 34		Top 0.7 ft of interval is same as above, this grades into a sandy gravel predominantly light gray (N7) subangular to rounded moderately well graded, max size is 5.5 cm some clay
	34.3 TO 35.3		0					35		NO Sample
	35.3 TO 36.6		1.45 (1)	GM GP		50%	50% is 2cm to CG 750% 6cm to VCG	36		Gravelly silt grayish orange (10 YR 7/4) max gravel size is 2 cm, some sand (top 6 in). Sandy gravel, angular to rounded poorly sorted graded, some silt, trace of clay
	36.6 TO 37.3		0					37		No Sample
	37.3 TO 38.7		1.55 (1)	GC GC			1.5cm to 2mm = 750% 6cm to 1cm = 50%	38		TOP 1/2 of interval is a clayey gravel, subangular to subrounded well graded, max size is approx. 1.5 some sand, Bottom 1/2 of interval is a clayey sandy gravel, subangular to rounded, poorly graded, max size is 6 cm, ~~so~~
	38.7 TO 39.3		0				6cm to VCG 750%	39		same as ~~last~~ bottom 1/2 of above interval with an increased amount of sand.
	39.3 TO 40		0.85 (1)	GC			↓			↓

NOTES General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 28-87BR

DATES DRILLED
ELEVATION
GEOLOGIST(S) TSO
DATE
CHECKED BY
DATE 7/20/89

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (IN. BELOW GS)	SAMPLE NUMBER	FEET OF CORE IN BOX	USCS SYMBOL ~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
40.0	40.0 TO 41.1		1.55 (2)	SC				41		Clayey med. to fine grained sand light greenish gray (5GY 8/1) poorly graded, some v coarse, + coarse grained sand + fine gravel. Trace of dark yellowish orange (10YR 6/6) staining.
	41.1 TO 41.3		0							No sample.
	41.3 TO 43.3		1.80 (1)	GP			6.5cm to 1cm 75%	42		Sandy gravel predominantly light gray (N7) subangular to sub-rounded poorly (moderately) graded, trace of clay (grayish orange (10YR 7/4)) max gravel size = 6.5 cm
								43		Same as above.
	43.3 TO 43.5		0.2	GP						
	43.5 TO 44.5		0					44		No Sample
	44.5 TO 45.5		0					45		No Sample
	45.5 TO 46.8		1.05	–				46		Claystone yellowish gray (5Y 7/2) massively bedded, well weathered moderately friable, trace of carbonaceous + medium grained sand inclusions.
	46.8 TO 47.0		0.38	–						Claystone light gray (N7) massively bedded, well weathered, highly friable, iron oxide staining within fractures, trace of carbonaceous staining.
	47.0 TO 49.0		2.09 (2)					47		
								48		Same as above w/ friability decreasing w/ depth
								49		
50.0	49.0 TO 50.0		0.94							Same as above, less friable less iron staining increase in carbonaceous material (coal + leaves?) + color is medium light gray (N6)

NOTES. General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 28-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TBD
DATE:
CHECKED BY: DATE:

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN HOLE	SAMPLE NUMBER	PCT OF CORE RECOVERY	RQD	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	STRATIGRAPHIC LOG	LITHOLOGIC DESCRIPTION
									51		
									52		
									53		
									54		
									55		
56.0 ↓ Box 1 of 10	56.0 -60.0	ND							56		CLAYSTONE - MED GREY (N5), MASSIVE BEDDING, MOD FRIABLE, SOME CARBONACOUS MATERIAL, VERTICLE COAL SEAMS, IRON STAINING AS MOTTLE & IN FRACTURES, TRACE OF SILT
									57		
									58		
									59		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 28-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TJD
DATE:
CHECKED BY:

USCS symbol

DATE: 8/4/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
											carbonaceous
	60.0 -62.0		(2) 0.95						61		CLAYSTONE - OLIVE GREY (5 Y 4/1), MASSIVE BEDDING, HIGHLY WEATHERED, MOD FRIABLE, TRACE OF IRON STAINING IS MOTTLED
	62.0 -65.5		(2) 1.8						62, 63, 64, 65		SAME AS ABOVE; MOD-HIGHLY FRIABLE, 80° COAL SEAM AT BOTTOM OF INTERVAL
Box 1 of 16 ↑ 67.6	65.5 -67.6		(2) 2.0						66, 67		CLAYSTONE - OLIVE GRAY (5 Y 4/1), MASSIVE BEDDING, HIGHLY WEATHERED, MOD FRIABLE TRACE OF CARBONACEOUS MATERIAL.
67.6 ↓ Box 2 of 16	67.6 -70.0		ND						68, 69		SAME AS ABOVE LIGHT OLIVE GRAY (5 Y 6/1)

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 28-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD & DAT
DATE:
CHECKED BY: DATE: 8/4/89

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FOOT	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE IN FOOT	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 16	70-74.0		ND						71, 72, 73		CLAYSTONE LIGHT OLIVE GRAY (5 Y 4/1), MASSIVE BEDDING, HIGHLY WEATHERED, MOD FRIABLE, TRACE OF CARB IN FIRST HALF OF INTERVAL, BECOMING VERY CARB IN LAST HALF OF INTERVAL
	74.0 -78.0		(1) 2.9						74, 75, 76, 77		SAME AS ABOVE DECREASED AMOUNT OF CARB THEN LAST HALF OF ABOVE INTERVAL, TRACE OF IRON STAINING
78 ↑											
78 ↓ Box 3 of 16	78-82		(2) 3.7						78, 79		SAME AS ABOVE, MOD LIGHT GREY (N6) TO LIGHT OLIVE GREY (5 Y 6/1) WITH INCREASE OF CARB MATERIAL, SOME VERTICAL FRACTURES APPARENT

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 28-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSO & DAT
DATE:
CHECKED BY:
DATE: 8/4/89
PROJECT NO: 667-11.22

USCS symbol

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
									81		
Box 3 of 16	82-86		(1) 3.15						82		CLAYSTONE - LIGHT OLIVE GREY (5 Y 6/1) TO OLIVE GREY (5 Y 4/1), WELL WEATHERED, MOD FRIABLE, SOME CARBONACEOUS MATERIAL, TRACE OF SILT
									83		
									84		
									85		
	86-90		1.65						86		SAME AS ABOVE; INCREASE OF CARB MATERIAL, SOME IRON STAINING
									87		NOTE Box 3 of 16 HAS INTERVAL 86-90', AND BOX 4 of 16 HAS INTERVAL 87.7-90' THEREFORE 'OVERLAPPING' INTERVALS
87.7 Box 4 of 16	87.7-90		(2) 1.9						88		CLAYSTONE - OLIVE GREY (5 Y 4/1), WELL WEATHERED, MOD-FRIABLE, SOME CARB WITH ABUNDENT CARB IN BOTTOM 5 INCHES
90									89		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 28-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD & DAT
DATE:
CHECKED BY:
DATE: 8/4/89

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 4 of 16	90-94		(1) 3.6						91, 92, 93		1ST HALF OF INTERVAL CONSISTS OF CARBONACEOUS CLAYSTONE - OLIVE BLACK (5 Y 2/1), WELL WEATHERED, MASSIVE BEDDING MOD FRIABLE, SMALL (1 MM) COAL SEAMS 2ND INTERVAL CONSISTS OF CLAYSTONE - LIGHT OLIVE GREY (5 Y 6/1) TO OLIVE GREY (5 Y 4/1), MASSIVE BEDDING WELL WEATHERED, SLIGHTLY TO MOD FRIABLE, SOME CARB MATERIAL
	94-98		(2) 3.8						94, 95, 96, 97		SAME AS ABOVE; OLIVE GRAY (5 Y 4/1) WITH IRON STAINING AT BOTTOM
98 ↑											
98 ↓ Box 5 of 16	98-102		(2) 3.5						98, 99		SAME AS ABOVE, WITH SOME SILT AND IRON STAINING AS MOTTLE

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
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(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 28-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD & DAT
DATE:
CHECKED BY: DATE: 8/4/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN PROFILE	SAMPLE NUMBER	FEET OF CORE RECOVERED	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	STRATIGRAPHIC LOG	LITHOLOGIC DESCRIPTION
									101		
	102-106		(2) 4.45						102		SILTY CLAYSTONE - OLIVE GREY (5 Y 4/1), MASSIVE, BEDDING WELL WEATHERED, MOD - SLIGHTLY FRIABLE, SOME FG SAND IN POCKETS AND LENSES, SOME CARB MATERIAL AND IRON STAINING
									103		
									104		
Box 5 of 16									105		
	106-107.1		(2) 1.15						106		SAME AS ABOVE, LESS SAND, CARB AND IRON STAINING
107.1 ↑									107		
107.1 ↓ Box 6 of 16	107.1-110.0		(2) 2.65						108		SAME AS ABOVE, GRADING INTO SILTSTONE IN BOTTOM 1' OF INTERVAL, PINKISH GREY (5 YR 8/1), WAVY BEDDING, WEATHERED, SLIGHTLY FRIABLE.
									109		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
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(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 28-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD & DAT
DATE:
CHECKED BY: DATE: 8/4/89

PROJECT NO: 667-11.22

Top/Bottom Depth Core Run	Top/Bottom Depth Core Run (in Feet)	Sample Run No.	Feet Recovered (USCS & Symbol)	Core Loss	Fracture Per Foot	Fracture Angle	Rock Type Angle	Drill Time Per Foot	Depth in Feet	Stratigraphic Log	LITHOLOGIC DESCRIPTION
	110-114		(2) 3.2						111, 112, 113		VERY FG SANDY SILTSTONE, YELLOWISH GREY (5 Y 8/1), WAVY LAMINATIONS, WELL WEATHERED, SLIGHTLY FRIABLE, SOME THIN CLAY LAYERS THROUGHOUT INTERVAL, SOME CARBONACEOUS & IRON STAINING. SLABBED ~~BOTTOM~~ TOP 4" OF BOTTOM 8" OF INTERVAL: PREDOMINATELY HORIZONTAL LAMINING FROM <1MM TO 14MM THICK, SMALL SCALE CROSS ~~TRUCKING~~ LAMINAE, POSSIBLE DE-WATERING STRUCTURE OR BIOTURBATION, IRON STAINING FOLLOWS ~~BEDDING PLANES~~ LAMINATIONS.
	114-116.95		ND						114, 115, 116		SAME AS ABOVE
116.95	116.95 -118		ND						117		SAME AS ABOVE; LIGHT OLIVE GREY (5 Y 6/1)
	118-122		(2) 3.65						118, 119		SILTY CLAYSTONE - LIGHT OLIVE GRAY (5 Y 6/1) TO OLIVE GRAY (5 Y 4/1), MASSIVE BEDDING, WELL WEATHERED, MOD FRIABLE, TRACE OF CARB MATERIALS

Box 6 of 16

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 28-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD & DAT
DATE:
CHECKED BY:
DATE: 8/4/89
PROJECT NO: 667-11.22

USCS symbol

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INCHES)	SAMPLE NUMBER	FEET OF CORE (INCHES)	FEET OF CORE IN ROW	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
									121		
	122-126		(2) 3.6						122		CLAYSTONE - LIGHT OLIVE GRAY (5 Y 6/1) TO OLIVE BLACK (5 Y 2/1), MASSIVE BEDDING, WELL WEATHERED, MOD FRIABLE, TRACE OF CARBONACEOUS BECOMING ABUNDUNTLY CARB IN CENTER OF INTERVAL
									123		
									124		
									125		
	126-126.9		ND						126		SAME AS ABOVE
126.9											
126.9	126.9 -130		(2) 1.7						127		CLAYSTONE - LIGHT OLIVE GREY (5 Y 6/1) BEDDING NON-APPARENT, MOD FRIABLE TRACE OF CARBONACEOUS MATERIAL
									128		
									129		

Box 7 of 16

Box 8 of 16

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 28-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD & DAT
DATE:
CHECKED BY:
DATE: 8/4/89
PROJECT NO. 667-11.22

USCS symbol

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN BOX (in feet)	SAMPLE NUMBER	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 8 of 16	130-134		(2) 4.75					131, 132, 133		CLAYSTONE - OLIVE GRAY (5 Y 4/1), MASSIVE BEDDING, WELL WEATHERED, MOD FRIABLE, SOME CARBONACEOUS MATERIAL
	134-136.55		ND					134, 135, 136		SAME AS ABOVE; WITH SOME IRON STAINING AS MOTTLE TOP OF INTERVAL WAS SLABBED - REVEALED SOME LAMINAE <1mm
136.55	136.55-138		ND					137		SAME AS ABOVE - LIGHT OLIVE GREY (5 Y 6/1), TRACE OF CARB MATERIAL
Box 9 of 16	138-142		ND					138, 139		SAME AS ABOVE - LIGHT OLIVE GREY (5 Y 6/1) TO OLIVE GREY (5 Y 4/1), WITH INCREASE OF CARB MATERIAL IN BOTTOM 1' OF INTERVAL.

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 29-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD & DAT
DATE:
CHECKED BY:
DATE: 8/4/89
PROJECT NO: 667-11.22

USCS symbol

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
									141		
Box 9 of 16	142-146		ND						142		CLAYSTONE, LIGHT OLIVE GREY (5 Y 6/1) TO OLIVE BLACK (5 Y 2/1), MASSIVE BEDDING, WEATHERED, MOD-SLIGHTLY FRIABLE, SOME CARBONACEOUS MATERIAL, SOME IRON, STAINING IN BOTTOM 1 1/2 OF INTERVAL
									143		
									144		
									145		
146.3	146-146.3		ND						146		CARBONACEOUS CLAYSTONE-OLIVE BLACK (5 Y 2/1), MASSIVE BEDDING, MOD-SLIGHTLY FRIABILITY, ~~SOME CARBONACEOUS MATERIAL~~ ZSA
146.3											
Box 10 of 16	146.3 TO 150.5		ND						147		Claystone - light grey (N7) massive bedding, mod friability, some iron staining as mottles at top of interval, trace of carb material at bottom of interval
									148		
									149		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 28-87BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TBD/DAT
DATE:
CHECKED BY:
DATE: 8/7/89
PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET (MEASURED)	SAMPLE NUMBER	FEET OF CORE (MEASURED)	FEET OF CORE (MEASURED)	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 10 of 16	150.5 TO 154.5		ND						151, 152, 153, 154		claystone olive gray (5Y4/1), massive bedding, mod. friability well weathered, trace carb. material & iron staining.
↑ 155.4	154.5 TO 155.4		ND ~~Or~~ 280						155		same as above; light olive gray (5Y6/1), no iron staining
155.4 ↓ Box 11 of 16	155.4 TO 159.0		ND						156, 157, 158		Same as above; olive gray (5Y4/1)
	159.0 TO 163.0								159		See Next Page

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 28-87BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LLD/DAT
DATE:
CHECKED BY: DATE: 8/7/89

USCS Symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE RECOVERED	FEET OF CORE LOST	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
BOX 11 of 16	159.0 TO 163.0		3.8 (2)						161, 162		Claystone - olive gray (5Y 4/1) massive bedding, well weathered, mod. friability, trace of carb material w/ increased amount of carb. material in bottom foot of interval, trace of iron staining ~~a few~~ LLD.
	163.0 TO 164.9		ND						163, 164		Same as above w/ increased iron staining, a few iron concretions, & a thin coal seam.
164.9	164.9 TO 168.0		2.8 (2)						165, 166, 167		Same as above w/ a few iron concretions & only a trace of iron staining & carb. material at bottom of interval.
BOX 12 of 16	168.0 TO 172.0		3.8 (2)						168, 169		SAME AS ABOVE W/ INCREASING AMOUNTS OF CARB MATERIAL, ~~AND~~ IRON CONCRETIONS AND IRON STAINING AS MOTTLED

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 28-87.BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): JDD/DAT
DATE:
CHECKED BY: DATE: 8/7/89

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 12 of 16	168.0 TO 172.0		3.8 (2)						171		
	172.0 TO 174.6		ND						172, 173, 174		CLAYSTONE - OLIVE GREY (5 Y 4/1), MASSIVE BEDDING, WELL WEATHERED, MOD. FRIABLE, SOME CARB MATERIAL DECREASING TO TRACE IN BOTTOM 1' OF INTERVAL, TRACE OF IRON STAINING, ½-1" COAL SEAM IN BOTTOM 1 FT OF INTERVAL
174.6	174.6 TO 176.0		ND		1/	85°-90°			175		Same as above; no carb. material one fracture ≈ 85°-90°
Box 13 of 16	176.0 TO 180		ND						176, 177, 178, 179		~~Same~~ Same as above w/ trace of carb. material at top of interval increasing to some carb material at bottom of interval. one 1mm thick coal seam.

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 28-87BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): [illegible]/DAT
DATE:
CHECKED BY: DATE: 8/7/89

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET (FRACTURE)	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
BOX 13 of 16 ↑ 185.9	180.0 TO 184.0		(2) 1.75			87°			181, 182, 183		Claystone - olive gray (5Y4/1) massive bedding, well weathered mod. friability, trace of iron staining & carb. material one fracture ≈ 87° (visible)
	184.0 TO 185.9		ND			30° 60°			184, 185		Same as above; light olive gray (5Y6/1), 2 fractures at bottom of interval ≈ 30°-60°
185.9 ↓ BOX 14 of 16	185.9 TO 188		ND			70° 50°			186, 187		First foot of interval is same as above w/ numerous fractures ranging from 50° to 70°. Bottom of interval appears to be ~~interval~~ interbedded w/ thin laminae of V.F.G. sand. Bottom 2" are as below.
	188.0 TO 1920		(2) 3.4						188, 189		Siltstone - lt olive gray (5Y6/1) massive bedding, weathered, slightly to non-friable, V.F.G. sand interbedded as thin laminae & @ bottom of interval clay is interbedded as thin laminae, trace of iron staining & carb. material

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 28-87BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): [illegible]/CAT
DATE:
CHECKED BY:
DATE: 8/7/89
PROJECT NO: 667-11.22

USCS symbol

Top/Bottom of Core in Box	Top/Bottom of Core in Box	Sample Number	Feet of Core	Feet of Core	Fractures per Foot	Fracture Angle	Bedding Angle	Grain Size Distribution	Depth in Feet	Lithologic Log	Lithologic Description
Box 14 of 16	188.0 TO 192.0		3.4 (2)						191		See previous page. Slabbed section reveals bedding to be thin laminae + one possible load cast
	192.0 TO 195.8		ND			48°			192, 193, 194, 195		claystone - to olive gray (5Y 6/1) massive bedding well weathered, mod. friable, trace of carb. material, & iron staining becoming silty at bottom foot of interval. one apparent fracture ≈ 40°
195.8	195.8-196		ND						196		SILTY CLAYSTONE - LT OLIVE GREY (5Y 6/1), MASSIVE BEDDING, WELL WEATHERED, MOD-SLIGHTLY FRIABLE, TRACE OF CARB MATERIAL, TRACE IRON STAINING
Box 15 of 16	196.0 TO 199.0		ND						197, 198		Top foot is same as above. Claystone - olive gray (5Y 4/1) mass. re bedding, well weathered, mod friable ~~to~~ trace carb. material
	199.0 TO 202.3		ND						199		Same as above

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 28-87BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TBD/DAT
DATE:
CHECKED BY:
DATE: 8/7/89
PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	DECIDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
→ Box 15 of 16	199.0 TO 202.0		ND			70°			201		
									202		Claystone - lt. olive gray (5Y6/1) massive bedding, well weathered mod. friable. trace of carb. material
	202.0 TO 204.4		ND						203		
204.4									204		
204.4 ↓	204.4 TO 205.0										same as above w/ trace of iron staining.
→ Box 16 of 16	205.0 TO 207.0								205		
									206		same as above
207.0									207		
											Bottom of boxes
									208		
									209		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 28-87

GEOLOGIST(S): DCB
DATE: 8/15/89

PROJECT NO:

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 to 0.9	0								No Sample
	0.9 to 2.0	0						1		No Sample
	2.0 to 2.5					>50% clay	CL	2		Silty Clay, grayish black (N2), moderately plastic, trace of gravel, to some gravel - gravel fraction increases in abundance with depth.
	2.5 to 3.9							3		
	3.9 to 4.0	0						4		NO SAMPLE
Box 1 of 1	4.0 to 5.9	0						5		No Sample
	5.9 to 7.0					>50% clay		6		Claystone, very light gray (N8) with mottled iron staining, dark yellowish orange (10YR 6/6), highly weathered, slightly to moderately friable, local occurrence of calcareous mineralization as small bodies < 1mm.
	7.0 to							7		
								8		
↑ 9.0	9.0							9		Bottom of Box 1 of 1 at 9.0 ft.

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 29-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:
DATE: 8/1/89
PROJECT NO: 667-11.22

USCS symbol

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 to 2.0		1.9 (1)	CL				Clay >60% Gravel >30%	1		Gravelly Clay Grayish orange (10yr 7/4) Moderate plasticity Some sand Trace Silt. Trace surfical roots at top of interval. Moderately calcitic Gravel angular to sub rounded mod well graded Max size 3.5cm Becoming more calcitic toward bottom
	2.0 to 4.0		2.0 (1)	CL				Clay >60% Sand <10% Silt 30%	2, 3		Silty sandy clay Grayish orange to moderate brown (10yr 7/4 to 10yr 5/4). moderately high plast. Abundant calcite Almost caliche Some gravel
	4.0 to 4.65		0	N/A					4		No Sample
Box 1 of 4	4.65 to 8.4		3.8 (1)	CL				Clay >80%	5, 6, 7, 8		~~Silty sandy~~ LA Clay. Mod yellowish brown and lt. brownish gray (5yr 6/1) High plasticity Some calcite stringers Trace gravel
↑ 9.7	8.4 to ~~8.4~~ 9.7		1.3 (1)	CL				Clay >80%	9		Same as above Slightly silty

Begin Box ↓ 2

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 29-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:
USCS symbol
DATE: ~~8/3/89~~ 8/1/89
PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE (Total Length)	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
9.7 ↓ Box 2 of 4	9.7 to 11.3		1.7(1)	CL				Clay >80%	11		Clay yellowish gray (5y 7/2) to dark yellowish orange High plasticity Abundant Calcite. Some gravel ≈15 cm
	11.3 to 14.3		4.0(1)	CL				Clay >80%	12, 13, 14		Same as above Color change to yellowish gray (5y 7/2) and light brown (5yr 5/6) toward bottom of interval
	14.3 to 16.3		2.7(1)	CL				Clay >80%	15, 16		Same as above
16.3 ↓ Box 3 of 4	16.3 to 17.3		2.1(1)	CL				Clay >50% Sand 20%	17		Clay Moderate yellowish brown (10yr 5/4), mod high plast Some sand. Some fine gravel Some calcite Increasing sand content toward bottom Sand med grained Few lg. cobbles at bottom
	17.3 to 19.8		.6(1)	CL				Clay >50% Silt+ Sand 30%	18, 19		Silty Clay Moderate yellowish brown (10yr 5/4) Moderate plasticity. Some sand Some gravel Max size 3cm f+vc gravel ~~Becomes more pure clay at bottom. Color change to dk. yellowish brown (10yr 4/2). Some iron staining.~~ LA

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 29-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY: DATE: 8/1/89

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE RECOVERED	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 3 of 4	19.3 to 22.83		5.1 (1)	CL				Clay >50% Clay Silt ≈10% Sand ≈10%	21 22		Silty clay. Grayish orange (10yr 7/4) mod plast. Some sand, some gravel max size 2cm Becomes more pure clay at bottom Color change to dk yell'ish brown (10yr 4/2) Some iron staining
22.8	22.3 to 22.8		1.1 (1)								Same as above Some sandy areas (f. grained)
22.9 Box 4 of 4	22.8 to 24.3		4.4 (1)	CL				Clay >80%	23 24		Clay. Pale yellowish brown (10yr 6/2) Some iron staining Trace carbonaceous material Trace silt Mod-High Plast. Begin Box 4
25.5	24.3 to 25.5		4.8 (1)	CL				Clay >80%	25		Clay Brownish gray (5yr 4/1) Trace iron staining. Color change to very pale orange + grayish orange (10yr 8/2 and 10yr 7/4) Higher silt content toward bottom Mod to High plast.
									26 27 28 29		~~Clay~~ Bottom of Boxes

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 29-87 9-87

PAGE | OF

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): UAA
DATE:
CHECKED BY: DATE: 7/28/89

USCS & Symbol

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN HOLE	SAMPLE NUMBER	FEET OF CORE RECOVERED	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 4 of 4										This box contained only 4 jars. It was marked "field screens." Was not logged.

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 30-87

GEOLOGIST(S): Day
DATE: 8/30/89

PROJECT NO: 6667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
								1, 2, 3, 4, 5, 6		Box 1 of 2 was NOT FOUND
6.6 ↓ Box 2 of 2	6.6 -9.3							7, 8, 9		CLAYSTONE, yellowish gray (5Y 8/1), non apparent bedding, well weathered mod-poorly friable, some iron staining along minor fractures, trace of Mg staining, trace of calc material, esp w/ fracture at ≈ 8.5', trace of silt
	9.3 -11.9									Same as above, some silt

NOTES. General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 30-87

GEOLOGIST(S): DAJ
DATE: 8/30/89

PROJECT NO: 6067-122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 2 11.9								11		See previous page
End of Boring								12 13 14 15 16 17 18 19		

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 30-87BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD
DATE:
CHECKED BY:
DATE: 8/2/89
PROJECT NO: 667-11.22

USCS symbol

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FOOT (IN FEET)	SAMPLE NUMBER	FEET OF CORE (IN FOOT)	~~FEET OF CORE IN FOOT~~	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 TO 2.0		ND	CL					1		Gravelly clay - Dusky yellowish brown (10YR 2/2) & moderate yelloish brown (10YR 4/2), low plasticity, some sand, trace of roots, & calcite
	2.0 TO 4.0		0.9 (1)	GC					2, 3		Clayey gravel - predom. med lt. gray (N6), angular to subrounded mod. graded, max size = 5cm, some sand, bottom 2" is a silty clay brownish gray (5YR 4/1), trace of sand, gravel, & roots
	4.0 TO 6.0		0.9 (2)	CL					4, 5		F.G. to m.g sandy clay mod. yellowish brown (10YR 5/4), med plast., trace of gravel, calcite in pockets.
	6.0 TO 8.0		2.3 (1)	CL					6, 7		Same as above w/ increase $CaCO_3$ & trace of iron stain na
	8.0 TO 10.0		2.25 (1)	CL					8, 9		Same as above w/ bottom 8" having less sand, increased $CaCO_3$ & some silt

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 30-87BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD
DATE:
CHECKED BY:
DATE: 8/2/89
PROJECT NO: 667-11.22

USCS symbol

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FOOT (IN FEET)	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
↑ 10.8	10.8 TO 10.8		0.8 (1)	ML							calcareous silt - very pale orange (10YR 8/2), some sand.
10.8 ↓	10.8 TO 12.0		NO	ML SC					11		1st 1/2 of interval is same as above grades into a clayey Fg. to v.c. G. sand, subrounded to rounded - Grayish orange (10 YR 7/4), mod. graded trace of $CaCO_3$ in pockets.
	12.0 TO 14.0		NO	CL CL/GC					12 13		FG. sandy clay - Grayish orange (10YR 7/4), med plast, some silt & $CaCO_3$ in pockets. 2nd 1/2 of interval is a sandy gravelly clay/clayey Gravel - subrounded, mod. sorted, max size = 7cm
	14.0 TO 16.0		0						14 15		NO Sample
	16.0 TO 17.0		0.8						16		Claystone - light olive gray (5Y 6/1), massive bedding, weathered, slightly friable, trace of iron staining & organic matter
	17.0 TO 18.0		1.1						17		Same as above
	18.0 TO 19.0		NO						18		Same as above; moderately friable, iron staining apparent in fractures.
	19.0 TO 20.0		0.45						19		Same as above, grayish orange (10YR 7/4) apparently very moist at one time

BOX 2 of 5

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 30-87BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD
DATE:
CHECKED BY: DATE: 8/2/89

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET (INTERVAL)	SAMPLE NUMBER	FEET OF CORE (INCHES)	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	20.0 TO 21.0		ND					21		Claystone - lt olive gray (5Y 6/1) massive bedding, well weathered, moderately friable, iron staining apparent in fractures & as mottles, trace of organic matter
↑ 22.0	21.0 TO 22.0		ND					22		Same as above; less iron staining.
22.0 ↓	22.0 TO 23.0		ND					23		Claystone - light olive gray (5Y 6/1) massive bedding, mod friable, highly weathered, iron staining in fractures, trace of organic staining.
	23.0 TO 24.0		ND					24		Same as above
	24.0 TO 25.0		(2) 1.2					25		Same as above, increased iron staining & organic matter
Box 3 of 4	25.0 TO 26.0		ND					26		Same as above
	26.0 TO 27.0		ND					27		Same as above
	27.0 TO 28.0	SL	0.8					28		Same as above.
	28.0 TO 29.0		ND					29		Same as above, increased iron staining (in fractures & as mottles).
↑ 30.0	29.0 TO 30.0		ND							Same as above

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 30-87BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD
DATE:
CHECKED BY:
DATE: 8/2/89
PROJECT NO: 667-11.22

USCS symbol

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (IN FEET)	SAMPLE NUMBER	FEET OF CORE IN BOX (INCHES)	FEET OF CORE IN ROW	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
30.0 ↓	30.0 TO 31.0		NO						31		claystone - med. lt. gray (N6) to lt olive gray (5Y6/1) massive bedding, well weathered, mod. friable, iron staining as mottles & in fractures, some organic matter
	31.0 TO 32.0		NO						32		Same as above
	32.0 TO 33.0		NO						33		same as above
	33.0 TO 34.0		NO						34		Same as above
	34.0 TO 35.0		NO						35		Same as above
	35.0 TO 36.0		NO						36		same as above
	36.0 TO 37.0		NO						37		Same as above
↑ 38.0	37.0 TO 38.0		NO						38		same as above
38.0 ↓	38.0 TO 39.0		NO						39		silty claystone - lt olive gray massive bedding, well weathered mod. friable, iron staining as mottles + in fractures, trace of carbonaceous staining
	39.0 TO 40.0		NO								Same as above

BOX 4 of 5

BOX 5 of 5

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 30-87BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSO
DATE:
CHECKED BY:
DATE: 8/2/89

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FOOT (FT/FT/IN)	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 5 of 5	40.0 TO 41.0		ND								Claystone - light brownish gray (5YR 6/1) to med. lt. gray (N6) massive bedding, well weathered mod. friable, some iron staining infractures & as mottles, trace of carbonaceous staining, & silt
	41.0 TO 42.0		ND						41		Same as above w/ less iron staining & some silt & f sand in pockets
	42.0 TO 43.0		ND						42		Same as above w/ no silt or sand med dk gray (N4) & increased amount of carbonaceous material.
	43.0 TO 44.0		ND						43		Same as above w/ no iron staining.
43.0	44.0 TO 45.0		ND						44		Silty claystone - lt olive gray (5Y 6/1), massive bedding, well weathered mod friable, ~1mm thick coal seams (vertical), trace of iron staining,
									45		Bottom of Boxes
									46		
									47		
									48		
									49		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 30-87 ER

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 9/8/89
CHECKED BY:
DATE:

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN BOX (FT. BELOW)	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
									45		No Sample
45.5	45.5 to 48.0		N>					>50' clay	46, 47		Claystone, medium gray (N5), ~~well~~ DCB bedding not apparent (massive?), well weathered, highly friable, trace of silt.
	48.0 to 52.0		(1) 2.7						48, 49, 50, 51		
	52.0 to 56.0		(1) 1.0						52, 53		As above: color of changes to light olive gray (5 Y 6/1) at 52.0 ft with an increase in the silt fraction

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 30-87BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: [illegible]
CHECKED BY:
DATE:

PROJECT NO: 667-11.22

Top/Bottom of Core in Box	Top/Bottom of Core in Box (Elevation)	Sample Number	Feet of Core (Inches)	Feet of Core (Inches)	Fractures per Foot	Fracture Angle	Bedding Angle	Grain Size Distribution	Depth in Feet	Lithologic Log	Lithologic Description
6 / 1.5'	52.0 to 56.0		(1) 10					750 Clay	55, 56		As above
1.5'	56.0 to 58.0		ND						57		Claystone, medium light gray (N6), bedding appears to be horizontal based on core breaks, well with moderately friable some silt and carbonaceous mineralization. Interval becomes highly carbonaceous below 58 ft.
60.0	58.0 to 60.0		ND						58, 59		
60.0 / 6 / 2.0'	60.0 to 62.0		ND						60, 61		
2.0'	62.0 to 64.0		ND						62, 63		Claystone, medium gray (N5), bedding not apparent (massive?), weathered slightly friable, carbonaceous mineralization occurs on partings, trace of silt. Decrease in carbonaceous mineral [illegible]

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

69.7
DCB

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 30-87BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 2/8/89
CHECKED BY:
DATE:

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	64.0 to 66.0		(1) 0.4					>50% clay	65		As above
	66.0 to 68.0		ND ~~30~~ DCB						66, 67		
	68.0 to 70.0		ND						68, 69		
	70.0 to 72.0		ND						70, 71		
	72.0 to 74.0		ND						72, 73		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 30-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 8/8/89
CHECKED BY:
DATE:

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET (IN FEET)	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	DECKING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	79.0 to 78.0		NI					750' clay	75, 76, 77		As above
3 of 6 Box	78.0 to 82.0		NI						78, 79, 80, 81		
82.0	82.0										
82.0 Box 4 of 6	82.0 to 86.0								82, 83		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 30-87 DR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 3/8/89
CHECKED BY:
DATE:

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FOOT	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	82.0 to 86.0		(1)					>50% clay	85		As above with increase in silt fraction and change in color to light gray (N7)
	86.0 to 90.0								86, 87, 88, 89		Clayey siltstone light gray (N7), bedding appears to be horizontal and thin bedded, well weathered, slightly friable, carbonaceous mineralization occurs on partings.
Box 4 of 6	90.0 to 91.4								90, 91		
91.4	91.4 to 94.0		(1)						92, 93		
Box 5 of 6	94.0										

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 30-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 8/8/89
CHECKED BY:
DATE:

USCS symbol

PROJECT NO: 667-11.22

Top/Bottom of Core in Box	Top/Bottom of Core in Box (Depth)	Sample Number	Feet of Core	Feet of Core (Depth)	Fractures per Foot	Fracture Angle	Bedding Angle	Grain Size Distribution	Depth in Feet	Lithologic Log	Lithologic Description
Bot 5 of 6	94.0 to 98.0		(2) 3.0					>50' clay; >50' silt	95, 96, 97		Interval grades to silty claystone at ~94.0 ft. Slitty claystone, light gray (N7), bedding may be horizontal based on core breaks, well weathered, moderately [illegible] carbonaceous mineral [illegible] on partings, local iron stain. Slabbed interval shows bedding to be <2mm thick and to be deformed, possible dewatering structure, bioturbation.
	98.0 to 102.0		ND				20°	>50' clay	98, 99, 100, 101, 102		At 97.0 ft interval grades back to siltstone. Siltstone, light gray (N7) thin bedded <2mm, horizontal, weathered, slightly friable, slight clay fraction. Claystone, medium gray (N5), bedding ~~[illegible]~~ may be thin <2mm w/ 20° dip, well weathered, mod friable based on core breaks, carbonaceous mineralization on partings
102.0	102.0 to 106.0								103		Carbonaceous Claystone, grayish black (N2), thin bedded <1mm, horizontal bedding, weathered, highly friable, many coal tenses. Claystone, medium dark gray (N4).

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 30-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 5/8/89
CHECKED BY:
DATE:

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN BOX (PERCENT)	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	102.0 to 106.0							250' clay	105		thin horizontal bedding < 2mm, well weathered, moderately friable, abundant carbonaceous mineralization, some coal stringers. Reduction in carbonaceous material below 105.5 ft
	106.0 to 110.0								106, 107, 108, 109, 110		
									110, 111		Bottom of Box 6 of 6 at 110.0 ft

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 31-87

GEOLOGIST(S): LAA
DATE: 8/22/89
PROJECT NO: 607-1121

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
00	0.0	(1) 1.7				Clay ≈45% Gravel ≈30% Gravel ≈50%	CL	1		Gravelly Silty Clay Dk yellowish brown to grayish brown (10yr 4/2 to 5yr 3/2). Est. plast mod Gravel angular to sub-angular Poorly graded 2-4cm. Some grass + roots @ surface Some CaCO3 Some sand, v f g to v c g. Grades to Gravel w/ Caliche. Gravel well graded, granules to 5cm Angular to sub rounded. Still has some brown silty clay from above w/ the caliche
	2.0	(1) 1.9				Gravel ≈50%	GC	2, 3		Gravel and caliche No preferred color Angular to sub rounded well graded, granules to 4cm. Caliche + clay matrix Some sand, v f g to v c g.
Box 1 of 16	4.0	(1) 1.9				Gravel ≈45% Clay ≈35% Sand ≈20%	GC	4, 5, 6, 7		Clayey gravel. Gravel med dk gray (N4). Angular to sub angular mod. well graded, granules to 7cm Clay matrix lt brown (5yr 6/4 to 5/6). Est. plast. low. Sand v f.g. to v c g Abundant CaCO3.
	7.0	(1) 1.9				Clay ≈45% Clay ≈30% Sand ≈25%	GC	8, 9		Same as above, slightly less CaCO3
	11.2 ↓									

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 31-87

GEOLOGIST(S): LAA
DATE: 8/22/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 16	↑ 11.2							11		See previous page for description.
	12.5	1.4				Gravel 75%	GC	12		Clayey gravel Med dk gray (N4) Angular to sub angular Mod well graded, granules to 7cm Sandy Clay matrix, (+ brown (5yr 6/4 to 5/6). Est plast low Sand v f g. to v.c g. Some CaCO3.
	14.5	(1) 1.85				Gravel 75%	GC	13, 14		Same as above
	17.0	(1) 1.9				Clay ≈50%	CL	15, 16, 17		Sandy Gravelly Clay. Grayish orange (10yr 7/4) to dk yellowish brown (10yr 6/6.) Est. plast low. Gravel Sub angular to sub rounded Mod graded granules to 5 cm Sand, v.f g. to v c g Trace CaCO3
Box 2 of 16	22.0	(1) 1.9				Clay ≈50%	CL	18, 19		Same as above, gravel to 6cm

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 31-87

GEOLOGIST(S): LAA
DATE: 8/22/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 16	17.0 ↑ – 22.0	~~1.85~~ (1)				Clay ≈50%	CL	21		See previous page for discript
	22.0 – 24.5	1.85 (1)				Gravel ≈ 50%	GC	22, 23, 24		Sandy Clayey Gravel Dk gray (N3) Angular to Sub rounded Mod graded Max size 7cm Matrix Sandy [illegible] Grayish orange (10yr 7/4) ~~Mod~~ Plast. Low to mod. Sand v f.g to coarse.
25.75	24.5 – 25.75	1.85 (1)				Clay >50%	CL	25		Gravelly Sandy Clay. Lt brown (5yr 5/6) Est plast. Mod Gravel to 6cm. (mainly at top of interval) Mod graded. to Subrounded Sand v.f g to granules
Box 3 of 16	25.75 – 27.0	2.4 (1)				Clay >50%	CL	26		Sandy Clay, some gravel. Same as above Max size gravel ≈ 2cm.
	27.0 – 30.0 *	2.2 (1)				Clay >50% Sand ≈ 30%	CL	27, 28, 29		Sandy Clay, some gravel, same as above

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

* Had to erase to correct diagram.

LOG OF BORING NO. 31-87

GEOLOGIST(S): LAA
DATE: 8/22/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 3 of 16	30.0	(1) 2.3	LAA #12			Sand ≈50% Gravel ≈25%	GC	31, 32		Clayey Sand + Gravel lt. brown (5yr 5/6). Sand med grained to granules. Sub angular well graded Gravel Angular to Sub rounded Mod graded to 4 cm
	32.5									
		1 (1)				Clay ≈ 50%	CL	33, 34		Sandy gravelly clay Grayish orange to dk yellowish orange (10yr 6/6 to 7/4) Est plast. low sand v.f g to v.c.g. Gravel granules to 2cm Subrounded Some silt.
35.0	35.0							35		
Box 4 of 16		(1) 1.7				Sand ≈40% Gravel ≈40%	GC	36, 37		Clayey Sand lt gravel Grayish orange to dk yellowish orange (10yr 7/4 - 6/6) Sand v.f g to v.c g. Mod graded. Subrounded Gravel - granules to 5cm Subangular to Subrounded Mod graded Some silt.
	37.5									
		.75 (1)				Sand ≈40% Gravel ≈40%	GC	38, 39		Same as above
	40.0									

NOTES. General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 31-87

GEOLOGIST(S): UAA
DATE: 8/02/89
PROJECT NO: 207-127

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 4 of 16	40.0 – 42.5	0						41, 42		No Sample
	42.5 – 45.0	10 (1)				GC	Sand ≈40% Gravel ≈40%	43, 44, 45		Clayey sand & gravel. Grayish orange (10yr 7/4) Angular to rounded sand, v.f.g. to v.c.g. Gravel granules to 1.5 cm. (one cobble 5cm.) Mod. well graded. Some silt. This interval appears to have originally been wet
	45.0 – 47.5	28.5 (1)				Clay ≈50%	CL	46, 47		Silty Clay Pinkish gray (5yr 8/1) to Dk. yellowish orange. Est plast. ~~Mod~~ mod ~~to high~~. UAA
	47.5 – 48.6	18 (1)				Clay >50%	CL	48		Same as above, plast. mod to high
	48.0 – 50.0	24 (1)				Clay >50%	CL	49		Silty Clay. Same as above (May be highly weathered claystone)

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

LOG OF BORING NO. 31-87

GEOLOGIST(S): LAA
DATE: 8/22/89

PROJECT NO: 77-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 5 of 16	50.0	2.8(1)				CL	Clay >50%	51		~~Silty~~ LA Silty Clay Grayish orange (10yr 7/4) Est plasticity - Mod. to high.
	52.5						Clay >60%	52		Contact - Becomes Claystone Brownish gray - (5yr 4/1) Highly weathered. Slightly to mod friable. Some silt. Some iron iron staining. Bedding appears horizontal + thin with silt between layers
		2.8(1)					Clay >60%	53		Silty Claystone. Brownish gray (5yr 4/1). Highly weathered mod. to highly friable. Bedding not evident. Becomes very silty at bottom of interval. Trace iron staining
	55.0							54		
Box 6 of 16	55.0	LA ~~2.8(1)~~ 4.5(1)					Clay >50%	55		Same as above, siltier in some areas
	57.5							56		
								57		
								58		Bottom of Boxes *
								59		

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

* This ~~Box 6~~ Series and log was continued when 31-87 BR (7 of 16 thru 16 of 16) was discovered to begin exactly where 31-87 left off. It is assumed 31-87 BR is a continuation of 31-87.

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LOG OF BORING NO. 31-87 BR

GEOLOGIST(S): LAA
DATE: 8/22/89
PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
								51		
								52		
								53		Beginning of Boxes
	53.0							54		No Sample Notation on box marker said Cement.
								55		
								56		
Box 7 of 16	57.65 ~~57.5~~							57		
	57.65 58.0	.35(1)				Clay >70%		58		Claystone Brownish gray (5yr 4/1). Highly weathered, mod friable Bedding not evident, trace carb material. Some silt.
	62.0	4.3(1)		90°		Clay >70%		59		Same as above Some mod yellowish brown (10yr 5/4) discoloration Some possible slickensides on a vertical fracture. Some iron staining @ bottom of interval.

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 31-87 BR

GEOLOGIST(S): UAA
DATE: 8/22/89
PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	58 ↑							61		See above page for description
	62.0							62		
Box 7 of 16		(2) 3.85		90°		Clay > 60%		63, 64, 65		Claystone. Brownish gray. (5yr 4/1) Highly weathered. Mod friable. Bedding not evident. Some carb. material ~~Some~~ Trace iron staining. Trace silt.
66.0	66.0							66		
Begin New Box ↓ 66.0	66.0									
Box 8 of 16		(1) 4.35				Clay > 60%		67, 68, 69		Claystone Same as above. Bedding, horizontal, layers ~~Highly~~ UA Trace gravel (no iron stains inside).
	70.0									

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. B 31-87 BR

GEOLOGIST(S): LAA
DATE: 8/22/89
PROJECT NO: 1067-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 8 of 16	70.0	4.3 (1)				Clay 75%		71, 72, 73		Claystone. Brownish gray (5y 4/1) to Lt olive gray. (5y 6/1). Highly weathered, mod friable. Bedding not evident. Silty in areas.
	74.0							74		
74.45	74.45	.7 (1)				Clay 75%				Same as above
Box 9 of 16	78.0	3.5 (1)				Clay 25% Silt 75%		75, 76, 77, 78		Silty Claystone Lt. olive gray (5y 6/1). Highly weathered, mod. friable. Bedding appears as layered, horizontal from weathering. Abund carb material Trace iron staining.
	82.6	4.5 (1)				Clay 75%		79		Same as above, becoming less silty to claystone toward bottom of interval

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 31-87 BR

GEOLOGIST(S): LAA
DATE: 8/22/89

PROJECT NO: 2167-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 9 of 16								81		See previous page for description
	82.0							82		Silty claystone Brownish gray (5yr 4/1). Highly weathered, mod friable Bedding appears horizontal, layered (from weathering) abund. carb material.
							Clay >60%	83		
	18							84		
85.05	85.05							85		
85.05		.85					Clay >60%			Silty Claystone, same as above
	86.0							86		
Box 10 of 16		(1) 4.15					Clay >50%	87		Same as above Becoming siltier toward bottom Beds appear to begin to tilt toward bottom Not as ~~carb.~~ carb. toward bottom, but still has some.
								88		
								89		
	90.0									

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 31-87 BR

GEOLOGIST(S): LAA
DATE: 8/22/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 10 of 16	90.0 – 92.0	2.2				Clay >50%		91		Silty Claystone. Lt. Olive gray to olive gray. (5y 6/1 to 4/1). Highly weathered. ~~Highly~~ Mod. friable. Bedding not evident. Some carb. material. Some mod brown discoloration. Trace iron staining.
	92.0 – 93.0	.9				Clay ≈50%		92		Same as above, some ~~very silty~~ LA Silt layers
Box 11 of 16	93.0 – 96.0	(1) 3.0	~~30~~	30°	30°	Clay >50%		93, 94, 95		Interbedded Siltstones + claystones Lt olive gray (5y 6/1) to olive gray (5y 4/1). Highly weathered mod friable. Bedding not clear but appears to be tilted in some areas. Some fractures also show possible tilted bedding. Some carb. material.
	96.0 – 100.0	4.6 (1)				Clay >60%		96, 97, 98, 99		Same as above. Some Lt brown (5yr 5/6) discolorations in matrix. Some rusted metal (probably nails from drilling operation) at top of interval

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 31-87BR

GEOLOGIST(S): LAA
DATE: 8/22/89
PROJECT NO: 1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 11 of 16	100.0	1.9(1)				Clay 75%		101, 102		Silty Claystone (+ olive gray (5y 5/1). Mod. Weathered. Slightly to mod friable Bedding not evident. Trace carb material. Trace iron staining
102.3	102.3									
Box 12 of 16		1.85(1)				Clay 75%		103		Same as above
104.0	104.0							104		
Box 13 of 16		3.9(2)				Clay 75%		105, 106, 107		Same as above
	107.8									
	108.0							108		NO SAMPLE
	108.0	(1) 3.15				Clay 75%		109		Same as above
	110.7									

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 31-87 BR

GEOLOGIST(S): LAA
DATE: 8/22/89

PROJECT NO: 6167-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 13 of 16	110.7									See previous page for description.
	112.0	1.2 (2)				Clay >50%		111		Silty Claystone Lt olive gray (5y 6/1) Mod weathered slightly to mod friable Bedding appears horizontally layered from weathering. Some carb. material. Some v.f.g sand in silt layers.
112.5	112.5	.45 (2)				Clay >50%		112		Same as above
Box 14 of 16	116.0	3.4 (2)	SL SL			Sand ~60% Silt ~30%		113 114 115 116	SS SS SS SS	Silty Sandstone Lt olive gray (5y 6/1) to yellowish gray (5y 8/1). Mod weathered. Slightly to mod friable Bedding appears distorted, not in definable layers may be soft sed deformation. Some silty claystone thin layers in very upper portion of interval (top 3 in) Sand vf g. to fg mod well sorted. Trace carb material/coal. Trace clay Bedding gets slightly more defined and horizontally layered.
	120.0	3.9 (2)				Sand ~60% Silt ~30%		117 118 119	SS SS SS SS	Same as above

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 31-87 BR

GEOLOGIST(S): LAA
DATE: 8/22/89

PROJECT NO: 6.7-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 14 of 16	120.0 – 122.0	1.5 (2)	SL			Sand ≈50% S/H ≈20%		121, 122	SS, SS, SS	Silty sandstone yellowish gray to Lt olive gray (5y 8/1 to 6/1). Mod weathered. Mod to slightly friable Bedding distorted, possible burrow, soft sed deformation Sand v f g to f g mod well sorted Trace carb material
Box 15 of 16	122.0 – 124.0	2.05 (2)				Sand >70%		123	SS, SS	Same as above some horizontal layers Sand v f.g. to med grained
	124.0 – 128.0	3.75 (2)				Sand >70%		124, 125, 126, 127	SS, SS, SS, SS	Same as above some iron staining Becomes more carb toward bottom
	128.0 – 129.0	.75 (1)				Sand >50%		128	SS	Same as above ~~Sand~~ Lt some coarser sands in areas v.f g to v c g some iron staining tout some very thin coal seams (1mm) Horizontal
	129.0 – 129.2	.2 (1)				Clay >50%		129		Claystone, Lt brownish gray (5yr 6/1) slightly weathered, non to slightly friable - Bedding not evident (very hard)
	129.2 – 132.0	2.0 (1)				Clay >50%				see next page for description.

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 31-87 BR

GEOLOGIST(S): LAA
DATE: 8/23/89

PROJECT NO: 67-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 15 of 16	129.2 ↑			35°	40°	Clay 750%		131		Claystone Brownish Black (5yr 2/1). Highly weathered. Mod friable. Bedding appears tilted 40° and layered Abundant carb. material. Some silt. Some Possible slickensides.
132.0	132.0							132		
132.0 Box 16 of 16		4.0 (2)				Clay 750%		133 134 135		Silty Claystone Lt. brownish gray (5y 4/1). Mod weathered slightly to mod. friable Bedding appears horizontal from fracture planes. Str some carb toward top Trace carb material oxidize.
	136.0							136		Same as above.
Bottom of Box 16		4 15 (2)				Clay 750%		137 138 139		
140.0	140.0									

Box 16 New Box

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible

Bottom of Boxes

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. DH 31-87

DATES DRILLED:
ELEVATION
GEOLOGIST(S): DCB
DATE: 7/26/89
CHECKED BY: DATE:

USCS SYMBOL

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 to 1.3		(1) 1.0	CL				35% gravel 25% ~~clay~~ sand 40% clay	1		Gravely, Sandy Clay, grayish orange (10 YR 7/4), low plasticity, root ~~fragments~~ OK DCB and wood fragments in upper 1.3 ft, some silt, locally calcareous. A Gradational change occurs below 1.3 ft. - Silty Clay, light gray (N7), moderate plasticity, locally calcareous, some fine sand, trace of root fragments, localized iron staining
	1.3 to 2.0		0					>50% clay		DCB	
	2.0 to 2.4		ND						2		
	2.4 to 4.0		(1) 1.6						3		
Box 1 of 2	4.0 to 6.2		(1) 1.5					>50% ~~Gravel~~ DCB >40% clay	4 5		~~Gravel (DCB) Clayey Gravel, variegated coloration, pink, very light gray, gray~~ Gravelly Clay, ~~moderate~~ reddish orange (10 R 6/6), moderate plasticity, abundant sand and caliche
	6.2 to 7.6		(1) 1.6						6 7		At 6.2 ft. a gradational change occurs. Gravelly Clay, grayish orange (10 YR 7/4), moderate plasticity, decrease in gravel, sand and caliche fraction
9.05	7.6 to 9.05		(1) 1.4						8		Below 7.6 ft. a gradational change occurs - Silty Sandstone, very light gray (N8) and grayish orange (10 YR 7/4), bedding not apparent, highly weathered, ~~highly~~, slightly friable, very fine grained
9.05	9.05 to 9.75		(1) .5						9		
	9.75 to 10.1		0								

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 21-87

DATES DRILLED:
ELEVATION
GEOLOGIST(S): DCB
DATE: 7/26/89
CHECKED BY: DATE:

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FOOT INTERVAL	SAMPLE NUMBER	FEET OF CORE IN FOOT INTERVAL	USCS SYMBOL ~~FEET OF CORE IN ROW~~	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 2	10.1 to 11.0		ND							A gradational change occurs below 10.1 ft. — Clay, yellowish gray (5 Y 8/1), mottled grayish orange (10 YR 7/4), moderate plasticity, some caliche and silt lenses of fine sand, localized iron staining.
	11.0 to 12.6		(1) .7	CL				11, 12		
	12.6 to 14.2		ND					13, 14		As Above — Two 5 cm size gravel occur at the base of the interval from 11.0 to 12.6
	14.2 to 15.1		ND					15		
↑ 15.9	15.1 to 15.9		(1) .45							
								16, 17, 18, 19		Bottom of Box 2 of 2 at 15.9.

Note this box marked 9.05 to 22.85 on its exterior. Core only runs from 9.05 to 15.9.

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 32-87 PAGE 1 OF 2

GEOLOGIST(S): TSD
DATE: 7/17/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 TO 2.0	(1) 1.23				5cm To 3.0 =5% 3.0-1.0cm =55% <1.0cm =40%		1		Gravel light gray (N7) to med-gray (N5) angular to subangular low to high sphericity, 5cm is max size, moderately graded, some sand + silt, trace of roots.
	2.0 TO 4.0	0						2, 3		No Sample
Box 1 of 2	4.0 TO 7.7	(1) 0.75				3.5cm TO 4.2cm = 10% <1.2cm =90%	GW/GP	4, 5, 6, 7		Sandy gravel very light gray (N8) angular to subrounded, low to moderate sphericity moderately graded, some silty clay. Trace of organics
	7.7 TO 10.2	(1) 1.73					NA	8, 9		Silty fine to very fine sandstone mottled very light gray (N8) + dark yellowish orange (10YR 6/6) calcareous mineralization as staining, (well weathered incompletely indurated?)

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible

This page has been re-copied to include the correct graphic lithologic log CKF

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH32-87

DATES DRILLED
ELEVATION
GEOLOGIST(S)
DATE
CHECKED BY DATE PROJECT NO

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN	SAMPLE NUMBER	FEET OF CORE IN BOX	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
BOX 2 of 2	10.2 TO 12.7		2.9 (1)					11, 12		Same as above
	12.7 TO ?		0.25					13		Same as above
	? TO 15.2		1.9 (1)					14, 15		Grades to a highly weathered fine sandy siltstone very pale orange (10YR 10/2), calcarious mineralization
	15.2 TO 15.5		0							NO SAMPLE
	15.5 TO 18.0		1.9 (1)					16, 17		Same as above mottled dark yellowish orange (10YR 6/6) & very pale orange (10YR 10/2) NO calcarious mineralization.
	18.0 TO 20.5		1.87 (1)					18, 19		Same as above

NOTES

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 32-87

DATES DRILLED
ELEVATION
GEOLOGIST(S) TSD
DATE
CHECKED BY DATE 7/17/89

USCS symbol

PROJECT NO

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN BOX (in feet)	SAMPLE NUMBER	FEET OF CORE IN BOX	~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 TO 2.0		1.23 (1)				5cm (max) 3.0 = 5% 3.0-10 cm = 55% <1.0cm = 40%	TO 1 2		Gravel light gray (N7) to med-gray (N5) angular to sub angular low to high sphericity, 5cm is max size, moderately graded, some sand & silt, trace of roots,
	2.0 TO 4.0		0					3		No Sample
	4.0 TO 7.7		0.75 (1)	GW/GP			3.5cm TO 1.2cm = ~~5%~~ 10% <1.2cm ~~95%~~ 90%	4 5 6 7		Sandy gravel very light gray (N8) angular to subrounded, low to moderately sphericity moderately graded, some silty clay. trace of organics
	7.7 TO 10.2		1.73 (1)	NA				8 9	? ?	Silty fine to very fine sandstone mottled very light gray (N8) & dark yellowish orange (10YR 6/6) calcerious mineralization ~~as~~ possible fracture fills, limonite staining, (well weathered / incompletely indurated ?)

Box 1 of 2

NOTES

ROCKY FLATS PLANT

FIGURE NO.

BR does not exist

LOG OF BORING NO. 32-87 (BR)

PAGE 1 OF 7/6

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD
DATE:
CHECKED BY:

USCS symbol

DATE: 8/3/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROCK (MT. ACTUAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 TO 2.0		ND	CL					1		silty sandy clay - yellowish gray (5Y 7/2) to light gray (N7) est. med. plast., some gravel trace of roots
	2.0 TO 4.0		ND	CL GM					2 3 4		first 3/4 of interval is same as above; moderate brown (5 YR 3/4) & more of a floury texture. Bottom 1/4 of interval grades into the description below.
BOX 1 of 8	4.0 TO 6.0		ND	GM							gravelly silt - mod. ...k (5YR 3/4), some ...e ranges from cohesive max gravel size =
	6.0 TO 8.0		ND	CL ?							...nterval is a gravelly ...to grayish orange ...low plast., some ...e of silt. Bottom ...al is a calcareous ...ish orange (10YR 7/4) ...lar to subrounded? ...d, max size = 6cm ...sand & clay. ...e appears to be ...anitic rock w/ sand ...infilling the fractures rather than, a gravel.)
↑ 8.0	8.0 TO 9.0		ND	?							
9.0 ↓											same as above

This well is actually 32-87

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 32-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD
DATE:
CHECKED BY:
DATE: 8/3/89
PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROCK (FT/SEC/IN)	SAMPLE NUMBER	FEET OF CORE IN BOX (INCHES)	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
BOX 2 of 8	9.0-10.5		ND	GC				750% is 74mm			Calcareous gravel - matrix is white (N9) to grayish orange (10YR 7/4) angular to subrounded, poorly graded, max size = 6.5cm some sand & clay.
	10.5 TO 11.5		(1) 1.5	GC				750% is 73mm	11		same as above
	11.5 TO 12.5		(1) 1.5	SP				750% is M.G.-VCG	12		M.G. to V.C.G sand - lt. brown (5YR 5/6) rounded to subrounded, poorly graded, some gravel, trace of clay.
	12.5 TO 14.0		(1) 1.5	SP GP				750% is 7VCG	13		Sand & gravel - lt. brown (5YR 5/6) subangular to rounded, mod. to poorly graded, max size = 6.5cm ~~some~~ clay, slightly calcareous trace of
↑ 16.0	14.0 TO 16.0		(1) 1.5	GC					14 15		Sandy gravel - grayish orange (10YR 7/4) angular to subrounded, poorly graded, max size = 5cm, some clay, calcareous
16.0 ↓	16.0-16.5		1.5 (1)	GC					16		same as above
	16.5 TO 17.2		0	-					17		No Sample
BOX 3 of 8	17.2 TO 19.0		ND	GC					18		Same as above w/ an increas in the clay fraction
	19-19.2		1.15 (1)	GC					19		same as above
	19.2 TO 21.2		ND	GC							Same as above

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 3287BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD
DATE:
CHECKED BY:
DATE: 8/3/89

PROJECT NO: 667-11.22

Top/Bottom of Core in Box	Top/Bottom of Core in Box	Sample Number	Feet of Core	USCS Symbol	Fractures per Foot	Fracture Angle	Bedding Angle	Grain Size Distribution	Depth in Feet	Lithologic Log	Lithologic Description
Box 3 of 8	19.2 to 21.2		ND	GC					21		Sandy Clayey Gravel - matrix is grayish orange (10 YR 7/4), angular to subrounded, mod. to poorly graded, max size = 5 cm, calcareous
↑ 23.2	21.2 to 23.2		1.8 (1)	GC					22, 23		Same as above w/ an increased clay fraction & No $CaCO_3$.
23.2 ↓	23.2 to 25.2		ND	SP GP					24, 25		23.2'-24.2' consist of gravelly M.G. Sand - lt brown (5YR 5/6) poorly graded, trace of clay. This grades into a ~~calcareous~~ silicous gravel - angular, mod. graded.
Box 4 of 8	25.2 to 27.2		1.35 (1)	GM GP					26, 27		Top 1/4 of interval consists of Gravelly Clayey Silt - grayish orange (10 YR 7/4). Bottom 3/4 of interval is same as previous description, w/ a trace of sand & clay.
	27.2 to 29.2		ND	SC CL					28, 29		Clayey M.G. to V.C.G. sand - mod. yellowish brown (10 YR 5/4) mod. to well graded, some gravel. This grades into a sandy clay at the bottom 1/4 of interval

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 32-87BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD
DATE:
CHECKED BY:
USCS SYMBOL
DATE: 8/3/89
PROJECT NO: 667-11.22

Depth Box Begin	Depth Box End	Sample Number	Pen Resist (blows/6")	USCS Symbol	Fracture Dip Pen Point	Fracture Angle	Drilling Angle	Sieve Size Of Gravel	Depth in Feet	Graphic Log	LITHOLOGIC DESCRIPTION
Box 4 of 8	29.2 TO 31.2		ND	SC			7	>50% is C.G.	31		Clayey F.G. TO V.C.G. sand-grayish orange (10 YR 7/4) well graded some gravel.
	31.2 TO 32.2		(1) 14	SC				>50% is >CG	32		Same as above
32.2 ↓	32.2 TO 33.2		(1) 18	SC				>50% is >CG	33		same as above; mottled w/ yellowish gray (5Y 8/1) + less gravel.
	33.2 TO 34.2		(1) 1.2	SC				>50% is >CG	34		Same as above
	34.2 TO 35.2		(1) 1.6	GC				>50% is >4mm	35		sandy gravel-matrix is grayish orange (10 YR 7/4) angular to sub-angular, well graded, max size = 6cm, some clay
Box 5 of 8	35.2 TO 36.2		ND	GP/GW	Sampled			>50% is >2mm	36		same as above; gravel is mod graded & generally much smaller, & less clay
	36.2 TO 37.2		(1) 0.75	SW				>50% is >MG	37		Gravelly F.G TO V.C.G sand-grayish orange (10YR 7/4), well graded, trace of clay.
38.2 ↑	37.2 TO 38.2		(1) 145	GW				>50% is >VCG	38		Sandy gravel - grayish orange (10YR 7/4) - subangular to subrounded, mod. graded, max size = 4.5 cm, trace of clay
38.2 ↓	38.2 TO 39.2		(1) 0.8	GW				>50% is >3mm	39		Same as above; max size = 5cm
Box 6 of 8	39.2 TO 40.2		(1) 0.9	GW				>50% is >3mm			Same as above; w/ a slight increase in clay content

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 32-87BR

PAGE 5 OF ~~6~~ 7 ← OK

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD
DATE:
CHECKED BY:

USCS symbol

DATE: 8/4/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET (IN INCHES)	SAMPLE NUMBER	FEET OF CORE (INCHES)	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 6 of 8	40.2 TO 41.2		ND	GW				750% is >5mm	41		Sandy Gravel-matrix is grayish orange (10 YR 6/2), subangular to subrounded, well graded, max size = 5.5cm; Trace of clay
	41.2 TO 42.2		(1) 1.55	GW CL					42		F.G.-M.G. sandy clay-very lt. gray (N8), med plast., some gravel. (TOP 5" is same as above)
	42.2 TO 43.2		(1) 1.5	CL GC					43		Fist foot of interval is same as above bottom 6" is a clayey Gravel-matrix, is dark yellowish orange (10 YR 6/6), subrounded, poorly ~~sorted~~ graded, max size = 5.5cm some sand. (bottom description)
44.2*	43.2 TO 44.2		(1) 1.8	GC					44		same as above, well graded max size = 5.5cm.
44.0*	44.0 TO 45.0		ND						45		same as above; grayish orange (10YR 7/4), angular to subrounded
	45.0 TO 46.0		(1) 1.7						46		SAME AS ABOVE, SUB ANGULAR - SUB-ROUNDED
Box 7 of 8	46.0 TO 47.0		(1) 1.7						47		SILTY CLAYSTONE — LIGHT GRAY (N7), MASSIVE BEDDING, WELL WEATHERED, MOD FRIABLE, TRACE OF CARBONACEOUS, TRACE OF IRON STAINING
	47.0 TO 48.0		(1) 0.5						48		SAME AS ABOVE, WITH INCREASED IRON STAINING
49.0	48.0 TO 49.0		(1) 24						49		SAME AS ABOVE, BROWNISH-GREY (5YR 4/1), MOD-HIGHLY FRIABLE, MOIST (TOP 1 OF SAMPLE), BOTTOM OF INTERVAL — SAME AS 47-48 SAMPLE
erased vertical line											NO SAMPLE
49.3	49.3-50.3		(1) 1.8								SILTY CLAYSTONE; BROWNISH-GREY (5 YR 4/1), BEDDING NON-APPARENT, HIGHLY WEATHERED, MOD FRIABLE, SOME IRON STAINING AS MOTTLE, CARBONACEOUS AND IN FRACTURES

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

* these numbers (44.2 & 44.0) are correct according to the cores

LOG OF BORING NO. 32-87 BR

JWL

DATES DRILLED:
ELEVATION:
GEOLOGIST(S):
DATE:
CHECKED BY: DATE:

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN BOX (FT. BELOW)	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
											MATERIAL, MG SAND IN POCKETS,
	50.3 TO 51.3		ND			90°-20°			51		SILTY CLAYSTONE - LIGHT GREY (N7), MASSIVE BEDDING, HIGHLY WEATHERED, MOD FRIABLE, SOME CARBONACEOUS MATERIAL, IRON STAINING AS MOTTLE & FRACTURES, MOD FRACTURED
											END OF BOXES
									52		
									53		
									54		
									55		
									56		
									57		
									58		
									59		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 33-87

GEOLOGIST(S): DCB / GCE
DATE: 7/19/89

PROJECT NO: 6607-11.25

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓ Box 1 of 2	0.0 to 2.0	(1) 1.5				4.5cm to 0.2cm = 40% VCG-MG = 15% FG = 25% FINES = 20%	GP	1 2		Sandy Silty Gravel, med dark gray (N4), subangular - subrounded, poorly graded gravel, some carbonate mineralization in fine grained fraction
↑ 4.0	2.0 to 4.0	(1) 2.2				6mm-2mm = 10% VCG-FG = 35% FINES = 55%	CL	3 4		Silty Sandy Clay, light olive gray (5Y 6/1), low to moderate plasticity Some gravel.
		0						5 6 7		
	7.8 to 10.3	(1) 2.2				3.0cm - 0.2cm = 10% VCG-CG = 5% MG-FG = 85%	SP	8 9		Sand, dark yellowish orange (10YR 6/6) Subrounded-well rounded, poorly graded, some gravel. At approx. 9.2 ft this interval grades to a claystone, very pale orange 10YR 8/2, mottled dark yellowish orange (10YR 6/6) (con't)

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

This log has been recopied to include correct graphic lithologic log. CKF

ROCKY FLATS PLANT

FIGURE NO.

BG Background 250-300 cpm
Core box 1 50 cpm - 150 cpm
Core box 2 40 cpm - 130 cpm

LOG OF BORING NO. BH-33-87

DATES DRILLED
ELEVATION
GEOLOGIST(S) DCB/GCE
DATE 11/19/89
CHECKED BY DATE

PROJECT NO 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN HOLE (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	2.0 to 10.3 cont'd		cont'd			30°			10.3		(cont'd) SAND LENSES 5 cm to < 1 m THICK, IRON OXIDE STAINS ON BEDDING PLANES AND FRACTURES SOME CARBONATE MINERALIZATION
											As above, fractures not apparent
Box 1 of 2	~~10.3~~ to 12.8		(1) 2.0'					FG = 100%	11 12		STONE FINE GRAINED SAND, YELLOWISH GRAY (5Y 8/1) AND DARK YELLOWISH ORANGE (10 YR 6/6), SUBROUNDED TO ROUNDED, POORLY GRADED, interval is heavily weathered, SOME CALCEREOUS MINERALIZATION.
~~12.8~~ Box 2 of 2 (12.8)	12.8 to ~~17.8~~ 15.3		2.3' (1) ~~4.8'~~						13 14 15		SAME AS ABOVE
	15.3 to 17.8		(1) 1.65'						16 17		HEAVILY WEATHERED CLAYSTONE, MOTTLED DARK YELLOWISH ORANGE (10 YR 6/6) TO LIGHT GRAY (N7), IRON STAINING AND BLACK CARBONACEOUS MINERALIZATION APPARENT AT CORE BREAKS, FINE TO MEDIUM GREY SANDSTONE OCCURS IN LAST .2 FT OF THIS INTERVAL.
	~~17.8~~ to 20.3		(1) 2.0'						18 19		SANDSTONE, HEAVILY WEATHERED, MOTTLED VERY LIGHT GREY (N8) TO DARK YELLOWISH ORANGE (10YR 6/6), CLAYSTONE LENS 1 cm THICK, ~~[illegible]~~ LINEAR CARBONACEOUS MINERALIZATION APPARENT ON BEDDING PLANES, POSSIBLY PLANT REMAINS. LOWER .4 ft GRADES TO CLAYSTONE, HEAVILY WEATHERED dark yellowish orange (10 YR 6/6), carbonaceous mineralization throughout

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

βγ BACKGROUND 250-300 cpm

CORE BOX 2 40 - 130 cpm

LOG OF BORING NO.

DATES DRILLED
ELEVATION
GEOLOGIST(S) DCB/GCE
DATE 7/19/89
CHECKED BY
DATE

BH 33-87

PROJECT NO 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	~~FEET OF CORE IN RUN~~ USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
(20.8)	(1) 8+20.3 cont		(1) cont								STONE SEE PAGE 2
↓			(1) <10'					FG-VFG 80% CLAY/20%			SAND, PALE YELLOWISH ORANGE (10YR 8/6) SUBANGULAR TO SUBROUNDED, POORLY GRADED, SOME CLAY (20%)
(20.8)									21.0		BOTTOM OF BOX (20.8)

NOTE: SAMPLE JARS FROM 5, 10, 15 ft OCCUR IN THE INTERVAL FROM 17.8 - 20.3 ft.

NOTES General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

Br

SEE PAGE 2

LOG OF BORING NO. BH 33-87

DATES DRILLED
ELEVATION
GEOLOGIST(S) DCB/GCE
DATE 7/19/89
CHECKED BY
DATE

USCS symbol

PROJECT NO 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (interval)	SAMPLE NUMBER	FEET OF CORE IN BOX (interval)	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓ BOX 1 of 2	0.0 to 2.0		(1) 1.5'	GP				4.5 cm to 2 cm 40%; VCG to MG 15%; FG 25%; FINES 20%	1, 2		SANDY SILTY GRAVEL, MED DARK GREY (N4), SUBANG-SUBROUNDED, POORLY GRADED GRAVEL, SOME CARBONATE MINERALIZATION IN FINE GRAINED FRACTION
	2.0 to 4.0		(1) 2.2'	CL				6 cm to 2 mm 10%; VCG-FG 35%; FINES 55%	3, 4		SILTY SANDY CLAY, LIGHT OLIVE GRAY (5Y) 6/1, LOW TO MODERATE PLASTICITY, SOME GRAVEL
			0					30 cm to 2 cm 10	5, 6, 7		
	7.8 to 10.3		(1) 2.2	SP				30 cm to 2 cm 10%; VCG-CG 5%; MG-FG 85%	8, 9		SAND, DARK YELLOWISH ORANGE (10YR) 6/6, SUBROUNDED - WELL ROUNDED, POORLY GRADED, SOME GRAVEL. AT APPROX 9.2 ft THIS INTERVAL GRADES TO A CLAY (STONE) CLAY, VERY PALE ORANGE 10YR 8/2, MOTTLED DARK YELLOWISH ORANGE 10YR 6/6 (con't)

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

β γ BACK GROUND 250 - 300
CORE BOX 1 50 CPM to 150 CPM
CORE BOX 2 40-130 CPM

VOID GCB

LOG OF BORING NO. BH 33-87

PAGE 1 OF

DATES DRILLED
ELEVATION
GEOLOGIST(S) DCB GCE USCS symbol
DATE 7/19/89
CHECKED BY DATE

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN BOX (in feet)	SAMPLE NUMBER	FEET OF CORE IN BOX (in feet)	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0 0	0.0 to 2.0		(1) 1.5'					4.5cm to 2mm 35% VCG to FG 35% Fines 30%	1		Silty Sand/Silty Gravel, Sand pink-light gray (5 YR 8/1) subrounded,
Box 1 of 2	2.0 to 4.0		(1) 2.2'						2, 3		
	4.0 to 7.8		0						4, 5, 6, 7		
	7.8 to 10.3		(1) 2.2						8, 9		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

3 γ Background 250-200
Core Box 1/1 50 cpm to 150 cpm
Core Box 1/2

LOG OF BORING NO. 34-87 BR PAGE 1 OF 5

GEOLOGIST(S): DCB
DATE: 9/1/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0 to 1.5	(1) .6				~50% Gravel	CL GC	1		Clay, dark yellowish brown (10 YR 4/2), moderate plasticity, some silt and root fragments and gravel. Interval graded to Clayey, Sandy Gravel with cobbles in matrix, dominantly med. gray (N5), subangular, moderately graded max. size 3 cm.
	1.5 to 5.0	0						2, 3, 4, 5		No Sample
	5.0 to 10.0	(1) .7				~50% Gravel	GC	6, 7, 8, 9		Clayey sandy Gravel with cobbles in matrix, dominantly med. light gray (N5), subangular, moderately graded, max. size 3 cm.

NOTES. General USCS is modified for this log as follows.
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 34-87DR

GEOLOGIST(S): DCB
DATE: 9/1/89

PROJECT NO: 667-11-22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	10.0 to 15.0	(1) .6				~50% Gravel	GC	11, 12, 13, 14, 15		Clayey Sandy Gravel with caliche as above.
	15.0 to 20	0						15, 16, 17, 18, 19		No Sample

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 24-87 BR PAGE 3 OF 5

GEOLOGIST(S): DCB
DATE: 9/1/89

PROJECT NO: 667-11-22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	20.0					>50% clay				Claystone, very light gray (N8), bedding not apparent, well weathered, slightly friable, local iron staining, occasional mg oxides.
		(1)						21		
	to	1.1						22		
								23		
								24		
	25.0							25		
	25.0									
								26		
	to	(1)						27		
		.9						28		
								29		
	30.0									

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 34-87 BR

GEOLOGIST(S): DCB
DATE: 9/1/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	30.0 to 35.0	(1) 1.0				>50% clay		31, 32, 33, 34, 35		Claystone, moderate yellowish brown (10 YR 5/4), bedding not apparent, well weathered, slightly friable, some silt, local iron staining.
	35.0 to 40.0	(1) .70						36, 37, 38, 39		Claystone, very light gray (N8), bedding not apparent, weathered, slightly friable, occasional iron staining.

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 34-87-BR PAGE 5 OF 5

GEOLOGIST(S): DCB
DATE: 9/1/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	40.0								---	Claystone as above
								41	---	
	to	(1)							---	
								42	---	
		.75							---	
								43	---	
								44	---	
1/2	45.0								---	
	45.0							45		Claystone, medium light gray (NG), bedding not apparent, weathered, slightly friable, calcareous material occurs on several broken core segments as a moderate brown rind.
								46	---	
Bot		(1)							---	
	to	.9						47	---	
								48	---	
								49	---	
↑ 50.0	50.0								---	

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 34-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:
DATE: 7/27/89

USCS SYMBOL

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (MARVEL)	SAMPLE NUMBER	FEET OF CORE IN BOX (MARVEL)	FEET OF CORE IN ROW	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0			0								Clayey silt. Dark yellowish brown. Some surficial roots some gravel. (First 3rd of interval)
	1.5 to 5.0		0.7(1)	ML							Gravel with caliche rinds. Color predominantly Dark gray (N3). Angular to subangular Well graded Max size 30 cm Some sand + silt.
	5.0 to 10.0		0.65(1)	GC					5		Same as above
	10.0 to 15.0		0.75(1)	GC				Sand 35% Gravel 35% Clay 30%	10		Gravelly sand Moderate yellowish brown (10yr 5/4) Angular to subrounded. Well graded Max size (gravel) 2.5 cm Some clay
	15.0 to 20.0		0						15		No Sample
	20 to 25		1.2 (1)	CL					20		Clay (stone?) Light olive gray (5y 6/1) Slightly silty Some carbonaceous material. Some iron staining, Slightly friable, slightly weathered
	25 to 30		1.0 (1)	CL					25		Same as above, less silt Light gray to med light gray (N7 to N6)
	30 to 35	SL	1.1 (2)	CL					30		Claystone Moderate yellowish brown to light brown (5yr 5/6) Massive bedding. ~~No~~ slightly weathered Slightly friable. Trace carbonaceous material
	35 to 40		0.7	CL					35		Claystone Med. light gray (N6). Massive bedding Weathered. Slightly friable. Some iron staining
	40 to 45		0.7	CL					40		Same as above
	45 to 50		1.1	CL					45		Same as above
50.0											

Box 1 of 2

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

BR Box 1 50-150 cpm

LOG OF BORING NO. 34-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:
DATE: 7/27/89

USCS symbol

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
				0					X	No Sample
53.5 to Box 2 of 2 55.0	53.5 to 55.0		1 Oft					55		Same as above Claystone. Med. light gray (N6) massive bedding. Weathered slightly friable Some iron staining.
								60		Bottom of Boxes

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 34-87 BR

GEOLOGIST(S): LAA
DATE: 8/23/89

PROJECT NO: 1147-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
								51		
								52		
								53		
								54		
								55		Top of Boxes
55.5	55.5 56.0	.45 (2)			Clay 770%			56		Claystone Brownish gray (5yr 4/1) Mod weathered Slightly ~~weathered~~ Friable Bedding not evident Trace silt
	57.0	1.1 (1)			Clay 770%			57		Same as above mod friable. Some iron, rusts stained areas. (May be nails from drilling process Slightly calcareous matrix
Box 1 of 8	59.0	0						58		No Sample
	60.0	1.7 (1)			Clay 760%			59		Same as above, some silt.

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 34-87 BR

GEOLOGIST(S): UAA
DATE: 8/23/89
PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
						Clay >60%				See previous page for description
	60.8 / 61.0	0						61		No Sample.
	63.0	1.8 (2)				Clay >50%		62		Silty claystone Lt brownish gray (5yr 6/1) Mod weathered, mod friable Bedding appears horizontal from weathering but may be massive Matrix slightly calcitic
Box 1 of 8	64.8	1.8 (2)				Clay >50%		63 / 64		Same as above
	66.0	1.0 (1)				Clay >50%		65		Same as above Some carb material, some Lt brown discoloration (5yr 5/6) on one uneven fracture plane
66.75	66.75	.65 (1)				Clay >50%		66		Same as above.
	67.45	.7 (1)				Clay >50%		67		Silty Claystone. Lt Olive gray (5y 6/1) to Brownish gray (5yr 4/1). Mod to highly weathered, mod friable Bedding not evident Some nodules very hard silt, mod yellowish brown (10yr 5/4).
Box 2 of 8	69.0	.85 (1)		60°		Clay >50%		68		Silty Claystone Lt Brownish gray (5yr 4/1) Mod weathered. Mod friable Bedding not evident. Some carb. material.
	70.9	1.9 (2)				Clay >70%		69		Same as above not as silty

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 34-87 BR

GEOLOGIST(S): UA
DATE: 8/23/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 8	↑ 70.8									See previous page for description.
	~~70.0~~ 70.8 – 72.0	1.1 (1)	SL			Clay >50%		71		Silty Claystone Brownish gray (5yr 4/1). Mod weathered, mod friable Distorted bedding, possibly slump or soft sed deformation Some carb material Some very silty layers
	72.0 – 72.7	.65 (1)				Clay >50%		72		Same as above
	72.7 – 74.1	1.7 (2)				Clay >50%		73		Same as above, some spotty iron in matrix
	74.1 – 76.0	1.8 (2)				Clay >50%		74		Same as above
Box 3 of 8	76.0 – 77.6	1.7 (2)				Clay >50%		75		Silty Claystone + siltstone interbedded Pinkish gray to ~~th~~ brownish gray (5yr 8/1 to 4/1) Mod weathered, mod friable Bedding appears tilted but cannot determine angle Some carb material.
	77.6 – 79.45	1.8 (2)				Clay >50%		76		Same as above
	79.45 – 80.0	.6 (2)				Clay >50%		77		Same as above. Some vfg. sand

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 34-87 BR

GEOLOGIST(S): LAA
DATE: 8/23/84

PROJECT NO:

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 3 of 8	80 – 80.8	.9 (1)				Clay >50%		81		Silty Claystone. Brownish gray to pinkish gray (5yr 8/1 to 4/1). Bedding not evident. ~~Str~~ Mod lithified, mod friable. Some carb. material, some f g sand. Some spotty iron staining.
	80.65 – 82.65	1.85 (2)		29°		Clay >50%		82		Same as above. Some mod yellowish brown discoloration (10yr 5/4).
	82.65 – 84.0	1.5 (2)				Clay >80%		83		Claystone. Brownish gray (5yr 4/1). Mod weathered, mod friable. Bedding appears massive. Trace carb. material, spotty iron staining.
Box 4 of 8	84.0 – 85.7	1.6 (2)				Clay >80%		84, 85		Same as above
	85.7 – 87.4	1.8 (2)				Clay >80%		86, 87		Same as above. Some carb. material, some silt.
	87.4 – 88.0	.55 (1)				Clay >60%				Silty Claystone as above
	88.0 – 89.2	1.2 (1)				Clay >60%		88, 89		Same as above, bedding not evident
	89.2 – 89.6	3 (1)				Clay >50%				Same as above
	↓									No Sample

Begin New Box

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 34-87 BR

GEOLOGIST(S): LAA
DATE: 8/23/89
PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 4 of 8	89.6							91		No Sample
	92.0							92		
	93.3	1.3(1)				Clay >50%		93		Claystone Brownish gray (5yr 4/1). Mod weathered, mod friable. Bedding appears massive. Some carb material some possible slickensides.
	94.25	.9(1)				Clay >50%		94		Silty Claystone, as above.
95.15	95.15	.8(1)				Clay >50%		95		Same as above, some lt brown 5yr 5/6 discoloration in matrix.
										No Sample
96.0	96.0							96		
	97.8	1.8(1)	SL			Silt >50%		97		Clayey siltstone lt olive gray (5y 6/1) Slightly to mod weathered, Slightly friable Bedding distinct modular layers ~~not evident~~ Some carb material. Some lt brown discoloration (5yr 5/6). Some v f g sand
Box 5 of 8	98.0	3(1)				"		98		Same as above
	99.0	1.3(1)				Clay >50%		99		Silty Claystone Pinkish gray (5yr 8/1) to lt olive gray (5y 6/1) Slightly weathered, slightly friable, silt in very thin layers Some carb material.
	100.75	1.7(1)				Clay >50%				Same as above, some lt brown discoloration (5yr 5/6)

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 34-87 BR

GEOLOGIST(S): LAA
DATE: 8/23/89

PROJECT NO:

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 5 of 8	100.75									See previous page for description.
	101.0	.2(1)						101		Interbedded Siltstones + claystones Pinkish gray (5yr 8/1) to Lt. Olive gray (5y 6/1). Moderately weathered. Slightly friable Bedding in layers <1mm to ≈ 1in Some carb. material, ~~some~~ trace iron staining
	102.55	~~1.05~~ 1.5(1)				Clay ≈ 50% Silt ≈ 50%		102		Same as above
		1.4(1)				"		103		Same as above
104.0	104.0							104		
	104.0	1.6(1)				"		105		Same as above, abundant carb material Some grayish orange (10yr 7/4) discoloration on some of the silty areas
	105.65									
		1.7(1)				"		106		Same as above, some v.f.g Sand layers ≈ 1-2 in thick.
	107.45							107		
	108.0	5(1)				"		108		Same as above No sand
	109.1	1.05(1)				"		109		Same as above
	111.0 ↓	1.8(1)				Clay >50%				See next page for description.

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 34-87BR

GEOLOGIST(S): LAA
DATE: 8/23/89
PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 6 of 8	↑ 111.0					Clay >50%		111		Claystone. Olive gray (5y 4/1) Mod to highly weathered Mod friable Bedding not evident. Some silt. Trace discoloration (mod. yellowish brown (10yr 5/4). Vertical fracture shows possible slickensides
112.5	112.5	1.5 (1)				Clay >50%		112		Same as above
Box 7 of 8	114.3	1.8 (2)				Clay >70%		113, 114		Same as above w/ color [illegible] to Brownish black (5yr 2/1) Abundant carb material toward bottom.
	116.0	1.6 (2)				Clay >70%		115, 116		Same as above, color change back to Olive gray (5y 4/1) Some carb material
	117.8	1.85 (2)				Clay >70%		117		Same as above, color change back to Brownish black (5yr 2/1). Trace carb. material.
	119.65	1.8 (6)				>70%		118, 119		Same as above
	120.0	.7 (1)				>70%				Same as above

NOTES. General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 34-87BR

GEOLOGIST(S): UAA
DATE: 8/23/89

PROJECT NO: 667-122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	120.0	.85 (2)				Clay >60%				Claystone Olive gray (5y 4/1) Mod weathered, mod friable Bedding not evident Some carb material Some silt.
120.9	120.9									
		1.6 (2)				Clay >50%		121		Silty Claystone Lt Olive gray (5y 6/1). Mod weathered mod friable Bedding not evident. Some carb Material, abundant carbs toward bottom
Box 8 of 8	122.6							122		
		1.4 (2)				Clay >60%		123		Claystone as above Some silt Some carb material
124.0	124.0							124		
										Bottom of Boxes
								125		
								126		
								127		
								128		
								129		

Begin new box

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 34-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 2/3/87
CHECKED BY:
DATE:

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN DEPTH	TOP/BOTTOM OF CORE IN DEPTH (FT. BELOW)	SAMPLE NUMBER	FEET OF CORE	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	0.0 to 2.0		(1) 1.4	GP				>50% gravel	1		Gravel, light gray (N7), angular to subrounded, poorly graded, max. size 4 cm, calcite matrix with trace of clay
	2.0 to 4.0		N/D						2, 3		As above with increase in clay fraction gray in range (10 YR 7/4), calcite [illegible], [illegible] silt
	4.0 to 8.0		1.3						4, 5, 6, 7		
	8.0 to 10.0		1.4	CL				>50% clay	8, 9		Interval grades to a gravelly clay below 8.5 ft. Gravelly Clay, light brown (5 YR 6/4), low to moderate plasticity (est.), max gravel size 7 cm

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH-3 4-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 21 [illegible]
CHECKED BY:
DATE:

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FOOT	SAMPLE NUMBER	FEET OF CORE	~~FEET OF RUN~~	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	10.0 to 10.3		1.4 ft	SP				>50% sand			Clayey sand, light brown (5 1/2 6/4), very fine grained, moderately sorted, abundant silt, coarse gravel fraction from ~10.3 to 10.5 ft. max size 5cm. sand coarsens with depth to coarse grained at base of interval
	10.3 to 12.3								11		
									12		
									13		Bottom of box 2 of 2 at 12.3 FT.
									14		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

Box 1 and 2: overlap 0.3 ft. - 10.0 to 10.3 ft interval

LOG OF BORING NO. BH 34-87

DATES DRILLED
ELEVATION
GEOLOGIST(S): DCB
DATE: 7/26/89
CHECKED BY:
DATE:

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (interval)	SAMPLE NUMBER	FEET OF CORE (interval)	USCS symbol ~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0 0 ↓ Box 1 of 3	0 0 to 2.0		(1) 1.1				>50% Gravel	1		Gravel, medium light gray (NG), angular to subrounded, moderately graded, max. size 6 cm. some caliche, sand and silt, trace of clay, plant debris occurs in upper .2 ft. of interval.
	2 0 to 4.0		(1) 1.3	GP				2, 3		
	4.0 to 4.7		ND					4		As above, with an increase in the clay and caliche fraction in ~~of this~~ DCB the interval from 4.0 to 4.7
	4.7 to 6.7 DCB ~~6.7~~		(1) .25					5, 6		
	~~2 DCB~~ 6.7 to 8.7		(1) .5					7, 8		
	8.7 to 10.7		(1) 1.7	SP				9		Silty Sand, grayish orange pink (5 YR 7/2), subangular to rounded, poorly graded, very fine to fine grained, localized carbonate mineralization.

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 34-89

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE 7/26/89
CHECKED BY: DATE

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE	SAMPLE NUMBER	FEET OF CORE IN BOX / FEET OF CORE IN RUN	USCS symbol	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 3 8.7 to 10.7	8.7 to 10.7		(1) 1.7							See previous page
10.7 ↓ Box 2 of 3	10.7 to 12.7	GS	ND					11, 12		
	12.7 to 14.7		ND	SP				13, 14		
	14.7 to 16.7		(1) .45					15, 16		As above with some gravel, ~~subang~~ DCB variegated pink, gray, grayish white, subangular, poorly graded in interval from 14.7 ft to 16.7 ft
	16.7 to 18.7		(1) 1.0					17, 18		DCB A gradational change occurs at approximately 16.7 ft. Silty Sandstone, very light gray (N8) to yellowish gray (5Y 8/1), bedding < 1mm to 2mm thick, appears to have slumped during coring but is probably horizontal, highly weathered, highly friable.
	18.7 to 20.7		ND					19		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. DH 34-87

DATES DRILLED:
ELEVATION
GEOLOGIST(S): DCB
DATE: 7/25/89
CHECKED BY:
DATE:

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (interval)	SAMPLE NUMBER	FEET OF CORE IN BOX (interval)	FEET OF CORE IN RUN (USCS symbol)	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 3 ↑ 20.7	18.7 to 20.7		ND						20		(cont'd from previous page), very fine grained, well sorted, clay is present in sufficient amount to give a ground sample low plasticity, iron staining and possible ing oxides occur along bedding planes.
	20.7 to 22.7		(1) .8						21, 22		
Box 3 of 3 ↑ 24.7	22.7 to 24.7		ND						23, 24		
									25		Bottom of Box 3 of 3 at 24.7 ft

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 35-87

GEOLOGIST(S): LAA
DATE: 8/18/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 – 1.3	.5 (1)				Clay >50%	GC	1		Gravelly Clay Between dark reddish brown (10R3/4) To moderate brown (5yr 3/4) Est plast mod to high Gravel angular to subrounded granules to 3cm Mod graded Some Silt Trace sand v f g to mod grained Trace root material
	1.3 – 1.5	0								No sample
	1.5 – 2.9	.8 (1)				Gravel >70%	GW	2		Gravel Pale yellowish brown (10yr 6/2) Angular Mod well graded granules to 3cm Some Clay, Silt and sand v f g to v c g Some $CaCO_3$.
	2.9 – 3.0	0						3		No sample
	3.0 – 4.0	.4 (1)				Gravel >50%	GW	4		Same as above
	4.0 – 5.2	0						5		No sample
	5.2 – 6.0	2.5 (1)				Sand >50% Clay ≈40%	CL	6		Clayey Sand Grayish orange to very pale orange (10yr 7/4 to 8/2) Sand v f g to coarse, well graded Some gravel granules to 35cm Some silt, $CaCO_3$
	6.0 – 6.9	1.0 (1)				"	CL			Same as above
	6.9 – 8.4	0						7 – 8		No Sample
	8.4 – 9.1	.8 (1)				Sand ≈50% Clay ≈45%	CL	9		Same as above. Trace gravel
10.4	9.1 – 10.4	1.4 (1)				Clay >50%	CL			Silty Clay. Yellowish gray (5y 8/1) (Light) Mod to high plast Some $CaCO_3$

Box 1 of 2

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 35-87

GEOLOGIST(S): LAA
DATE: 8/18/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
10.4	10.4									
Box 2 of 2	12.4	2.2 (2)				Clay 70%	CL	11, 12		Silty Clay Pinkish gray (5yr 8/1) Est plast mod. to high. Begin Bo 2 ↓
14.4	14.4	2.0 (2)				Clay 70%	CL	13, 14		Silty Clay. yellowish gray (5y 8/1) Est plast mod to high some dk yellowish orange coloring toward bottom (10yr 6/6) Calcite stringer toward bottom
								15, 16, 17, 18, 19		Bottom of Boxes

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 35-87

GEOLOGIST(S): DCB
DATE: 8/30/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
50.0	50.0 to 50.5	ND				>50% clay				Clay, medium dark gray (N4), bedding & massive, slightly weathered slightly friable, moderate amount of carb. mineralization, slight amount of localized iron staining
	50.5 to 52.0	ND						51		
	52.0 to 53.5	ND						52		
								53		color grades to light gray (N7) by 53.2 ft.
	53.5 to 55.0	ND						54		
								55		Bottom of Box 6 of 6 at 55.0 ft.
								56		
								57		
								58		
								59		

NOTES. General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

Boring 35-87 Box 6/6; other boxes in this sequence were not in the trailer

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 35-87

GEOLOGIST(S): [illegible]
DATE: 8/30/89

PROJECT NO: 6671/22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
00	0.0-1.2	0.8				70% GRAVEL 30% CLAY	GC	1		CLAYEY GRAVEL, top of interval matrix color is dusky yellowish brown (10 YR 2/2), bottom is light brownish gray (5 YR 6/1), sub angular-subrounded, max size = 1 cm, bottom is slightly calc
	1.2-2.0	∅						2		NO SAMPLE
	2.0-2.7	0.3				60% GRAVEL 40% CLAY	GC			Same as above
	2.7-3.9	0.9				60% GRAVEL 40% CALC MATERIAL	GC	3		CALCAREOUS GRAVEL, matrix color is pinkish gray (5 YR 8/1), angular-sub angular mod-well graded, max size = 5 cm, some sand
	3.9-4.0	∅						4		NO SAMPLE
	4.0-4.35	0.2				60% G 40% CALC	GC			Same as above
	4.35-5.0	0.7				SAME AS ABOVE	GC			Same as above moderate orange pink (5 YR 8/4), max size = 7 cm
	5.0-6.0	∅						5		NO SAMPLE
	6.0-6.8	0.5				50% GRAVEL 30% CALC 20% CLAY	GC	6		Same as above
	6.8-7.4	0.7				SAME	GC	7		Same as above some clay
	7.4-8.3	0.8						8		No SAMPLE
	8.3-9.2	0.7				SAME	GC	9		Same as above
	9.2-10.2	0.4				SAME	GC			Same as above pale yellowish orange (10 YR 8/6)

Box 1 of 3

NOTES. General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 35-87

GEOLOGIST(S): [illegible]
DATE: 8/30/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
↑ 10.5	10.2 10.3	0.4				[illegible]	GC		10.8	CALCAREOUS GRAVEL, matrix color is pale yellowish orange (10 YR 8/6), angular-subangular, mod-well graded, max [illegible] clay.
	10.3-10.5	0.5					GC		0.1	Same above
					50% GRAVEL 30% CALC 20% CLAY			11		
								12		
								13		
								14		
								15		
								16		
								17		
								18		
								19		

BOXES 2 & 3 OF 4 ARE NOT FOUND (could be the same as a box marked 2 OF 4, same bore hole #

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 35-87(??)

PAGE 1 OF 2

GEOLOGIST(S): [illegible]
DATE: 8/30/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
										Box 1 of 4 is missing?
10.7 ↓ Box 2 of 4	10.7 -12.5					80% GRAVEL 20% CLAY	GC	11, 12		CLAYEY GRAVEL, grayish orange (10 YR 7/4) grading to pale yellowish brown (10 YR 6/2), angular - subangular, max size = 7 cm Some FG-MG sand, slightly calc
	12.5 -14.3					60% GRAVEL 40% CLAY	GC	13, 14		Same as above. increased calc material and FG Sand at base of interval. average gravel size is smaller (≈3 cm) than above interval
	14.3-16.3					30% SAND 70% CLAY		15, 16		SANDY CLAYSTONE, very light gray (N8) and dark yellow brown (10 YR 6/6) from apparent bedding, highly weathered, mod friable, abundant iron staining, some Mg staining, Sand is VFG-FG
	16.3-18.3					30% SAND 70% CLAY		17, 18		Same as above. trace of Mg staining
	18.3-20.3					30% SAND 70% CLAY		19		Same as above

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 35-57(77)

GEOLOGIST(S): DAJ
DATE: 8/30/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
203										See previous page
END OF BOXES								21		Boxes 3 + 4 of 4 are missing
								22		
								23		
								24		
								25		
								26		
								27		
								28		
								29		

NOTES General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 36-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 8/2/89
CHECKED BY:
DATE:

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (IN FEET/FOOT)	SAMPLE NUMBER	FEET OF CORE (INCHES)	FEET OF CORE IN ROW	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 to 1.3		(1) .6	CL			>50' Clay	1		Gravelly Clay, DCB pale yellowish brown (10 YR 6/2), low plasticity, abundant carbonate mineralization, some plant debris, caliche rind occurs on gravel.
	1.3 to 2.0		0	X				2	X	No. Sample
1 of 2 Box	2.0 to 4.0		(1) 1.3	CL			>50' Clay / caliche	3		As above (reference interval 0.0 to 1.3), Clay component decreases below 3 ft. and is replaced by caliche.
	4.0 to 5.3		0	X				4 / 5	X	No. Sample
	5.3 to 6.0		0	X					X	No Sample
	6.0 to 6.6		(1) .35	GC			>50' Gravel	6		Clayey Gravel, medium gray (N5), clay matrix is grayish orange (10 YR 7/4), angular, poorly graded, max size 5.5 cm, some silt.
	6.6 to 10.0		0					7 / 8 / 9	X	No Sample

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 36-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 8/2/89
CHECKED BY: DATE:

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE RECOVERED	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	10.0 to 10.6		0								No Sample
	10.6 to 12.0		0						11, 12		No Sample
	12.0 to 12.65		0								No Sample
	12.65 to 16.2		0						13, 14, 15, 16		No Sample
	16.2 to 17.7		(1) .8	GC				>50% Gravel	17		Clayey Gravel, medium gray (N5), clay matrix is grayish orange (10 YR 7/4), angular to subrounded, poorly sorted, max. size 4 cm.
	17.7 to 19.2		0						18, 19		No Sample
	19.2 to 20.4		(1) .5	GC				>50% Gravel			As above (reference interval 16.2 to 17.7 ft). max gravel size is 2.5 cm

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 36-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 8/2/89
CHECKED BY:
DATE:

USCS SYMBOL

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 2 20.4	19.2 to 20.4		.5 (1)	GC				>50% Gravel			As above
20.4	20.4 to 21.0		ND	CL				>50% clay	21		As above upper 0.2 ft of interval, grades to Clay
	21.0 to 22.2		(1) .9						22		Clay, light olive gray (5Y6/1), high plasticity, localized iron staining.
Box 2 of 2	22.2 to 23.0		0						23		No Sample
	23.0 to 24.5		(1) .6	CL				>50% clay	24		As above (reference interval 20.6 to 22.2 ft.).
26.0	24.5 to 26.0		ND						25		
									26		Bottom of box 2 of 2 at 26.0 ft.
									27		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 36-87DR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 8/4/89
CHECKED BY:
DATE:

PROJECT NO: 667-11.22

Top/Bottom Depth in Feet	Top/Bottom Depth in Feet (Corrected)	Sample Number	Percent Recovery	USCS Symbol	Fracture Dip Direction	Fracture Dip Angle	Rock Quality Designation	Depth in Feet	Graphic Log	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 to 2.0		(1) 1.3	GC			>50% gravel	1, 2		Clayey Gravel, light gray (N7), clay matrix is dark yellowish brown (10 YR 4/2), angular, moderately sorted, max size 5.5 cm, some plant debris in upper 0.3 ft.
	2.0 to 4.0		ND					3		Gravel, light gray (N7), angular to subangular, moderately sorted, max size 4.5 cm, caliche matrix
	4.0 to 4.5		ND					4		As Above, gravel size, one is coarser, max size 6 cm, some sand
	4.5 to 5.0		0	X				5	X	No Sample
50+ 1 of 8	5.0 to 6.5		ND	GC			>50% gravel	6		Clayey Gravel, light gray (N7), clay matrix is light brown (5 YR 5/6), DCB angular to subrounded, poorly sorted, max. size 5.5 cm, some sand, caliche rind on gravel.
	6.5 to 7.0		0	X				7	X	No Sample
	7.0 to 9.0		ND	SP CL			>50% sand >50% clay	8		Gravelly Sand, grayish orange (10 YR 7/4), coarse grained to very fine grained, poorly graded, angular to subangular, some clay and calcareous mineralization, below 7.4 ft interval grades to Clay, very light gray (N7), high plasticity (est) local iron staining and bodies of caliche, some silt and stringers
	9.0 to 11.0		ND					9		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 36-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 2/4/89
CHECKED BY:
DATE:
PROJECT NO: 667-11.22

USCS symbol

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 8	9.0 to 11.0		ND	CL				>50% clay			As above caliche bodies/stringers ~~absent~~ as below 10 ft. less frequent
11.0	11.0 to 13.0		ND						11, 12		As above at 12 ft. (est depth) interval grades to very pale orange (10 YR 8/2)
	13.0 to 15.0		ND						13, 14		
Box 2/8	15.0 to 17.0		ND						15, 16		As above at 16 ft. (est depth) interval grades to Claystone, light gray (N7), bedding not apparent (massive?), highly weathered, moderate, friable, localized iron staining
18.4	17.0 to DCB ~~18.4~~		ND						17, 18		
18.4 ↓ 3 of 8	19.0								19		
Box	~~18.4~~ DCB 19.0 to 21.0										

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 36-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 5/4/87
CHECKED BY:
DATE:

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN BOX (IN FEET)	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 3 of 8	9.0 to 21.0		ND				DCB	85% ~~VFG~~ FG 15% VFG ~~FG~~	21		As above below 20 ft (est depth) interval grades from clay stone to siltstone to sandstone. Sandstone, yellowish gray (5 Y 7/2), bedding not apparent, may be horizontal from appearance of core breaks, highly weathered moderately friable, fingrained subangular to subrounded, well sorted, localized to wide spread iron staining.
	21.0 to 21.5		ND								
	21.5 to 23		ND						22		
	23 to 24.5		ND						23, 24		
	24.5 to 26		ND						25		
26.8 ↑	26.0 to 27.5		ND						26, 27		
26.8 ↓	27.5 to 29.0		ND						28		
Box 4 of 8	29.0 to 30.5		ND						29		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 36-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 2/4/86
CHECKED BY:
DATE:

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN DEPTH	TOP/BOTTOM OF CORE IN DEPTH	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	31.0 to 30.5		VD					85% ~~VFG~~ DCB FG 15% VFG			
	30.5 to 32.5		VD				23°		31, 32		As above, at about 21 ft bedding becomes distinct, 2mm and less in thickness.
	32.5 to 34.0		ND						33		
35.1	34.0 to 35.5		ND					80% FG 15% VFG 5% MG	34, 35		As above, at about 34.5, bedding thickness increases to 5mm and less, medium grained fraction present, reference grain size [illegible] column.
35.1	35.5 to 37.0		ND					60% VFG 30% FG 10% Fines	36		Sandstone, very light gray (N?) and grayish orange (10YR 7/4), bedding not apparent, highly weathered, highly friable, very fine grained DCB ~~with~~ to ~~[illegible]~~ DCB fine grained, poorly sorted, localized to widely disseminated iron staining.
	37.0 to 38.5		ND						37, 38		
	38.5 to 40		ND						39		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 36-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 8/4/89
CHECKED BY:
DATE:
USCS symbol
PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	40.0 to 41.5		(1)					60' VFG 30' FG 10' Fines	41		As above
	41.5 to 43		(1) .9					>95' MG <5' VFG	42		DCB ~~As above~~ At 42 ft (at depth) interval grades to medium grained, well rounded sandstone
50+	43 to 44		ND						43		
50+	44 to 45.5		(1) .7						44		
45.5	45.5								45		
45.3	45.5 to 47		ND					>50' Silt	46		Interval grades to siltstone below 45 ft. Siltstone, light gray (N7), well weathered, moderate to slightly friable, slight VFG sand fraction.
	47 to 48		(1) .3						47		
	48 to 49		0	X				X	48	X	~~No Sample~~
	49 to 49.5		ND						49		As above (reference interval 45.5 to 47.0 ft)
	49.5 to 50		ND								

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 36-87 DR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 5/7/87
CHECKED BY: DATE:
USCS Symbol
PROJECT NO: 667-11.22

TD/Bottom of Core in Box	TD/Bottom of Core in Box (Ft. BGS)	Sample No.	Feet of Core Recovered	Feet of Core Lost	Fractures per Foot	Fracture Angle	Boring Angle	Dominant Size of Cuttings	Depth in Feet	USCS Symbol	LITHOLOGIC DESCRIPTION
	50 to 51		ND					750' clay			Claystone, medium light olive gray (N6), bedding not apparent (massive?) well weathered, moderately to slightly friable, slight silt fraction
	51 to 52.5		ND						51		
	52.5 to 53.5		ND					65% VFG 35% silt	52		Silty Sandstone, very pale orange (10 YR 8/2) bedding not apparent (massive) highly weathered, moderately to very friable, very fine grained, [illegible] iron staining
	53.5 to 54.7		(1) .5						53		
	53.8 to 55.5		ND						54 55		
	55.5 to 56.0		0					X	56	X	NO Sample
	56.0 to 57.0		ND					65% VFG 35% silt	57		~~Silty Claystone, very light olive gray (N8), weathered, slightly friable, [illegible] above (weathered) [illegible]~~
57.5	57.0 to 57.5		ND					90% clay 10% silt			Silty Claystone, very light olive gray (N8), weathered, slightly friable, interval grades to Sandstone, dark yellowish orange (10 YR 6/6) bedding not apparent (massive), well weathered, moderately friable, very fine grained with [illegible] silt
57.5	57.5 to 58		ND					VFG 80% 20% silt	58		
	58 to 58.5		ND								
	58.5 to 59		ND					MG 75% 25% VFG	59		
	59 to 59.5		ND								Sandstone, grayish orange (10 YR 7/4) bedding not apparent (massive?) highly weathered, slightly friable, [illegible]
	59.5 to 60		ND								

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 32-87BR 36

PAGE 8 OF 8

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD/DCB
DATE:
CHECKED BY:
DATE: 8/4/89 / 8/7/89

PROJECT NO: 667-11.22

Top/Bottom of Core Run	Top/Bottom of Core Recovery	Sample Number	Feet of Core Recovered	Fractures per Foot	Fracture Angle	Bedding Angle	Grain Size Distribution	Depth in Feet	Lithologic Log	Lithologic Description
	60 to 61		(1) .7				MG 75% UFG 25%			(cont'd. from previous page), thus grades to medium grained (mostly fine and very fine grained) and highly friable.
	61 to 62		(1) .7					61		
	62 to 62.5		NO					62		
	62.5 to 63		NO				50% UFG			Sandstone, dark yellowish orange (10 YR 6/6), bedding not apparent (massive), well weathered, moderately to highly friable, very fine to med, well sorted, mode [illegible]
	63 to 64		NO				>50% Clay	63		
	64 to 65		NO					64		Claystone, medium light gray (N6), bedding not apparent (massive), well weathered, moderately friable, localized iron stain and carbonaceous mineralization. Interval grades to clay siltstone w/ depth - see lithologic log below.
	65 to 66		NO					65		
	66 to 66.5		NO					66		
66.5	66.5 TO 67.0		(#1) 035				>50% Clay			CLAYEY SILTSTONE - MED LIGHT GREY, MASSIVE BEDDING, WELL WEATHERED, SLIGHTLY FRIABLE, TRACE OF CARBONACEOUS AND IRON STAINING
	67.0 TO 68.0		(1) 075				>50% Clay	67		FINE GRAINED SANDSTONE - MOTTLED, VERY LT GREY (N-8) AND VERY PALE ORANGE (10 YR 8/2), MASSIVE BEDDING, HIGHLY WEATHERED, MOD FRIABLE, ~~POORLY GRADED~~ WELL SORTED, BECOMING CLAYEY AT BOTTOM OF INTERVAL
	68.0 TO 70.5		Ø					68 69		No Sample

BOX 8 OF 8

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. ~~32~~-87BR 36

PAGE ~~6~~ OF ~~7~~ 7

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD
DATE:
CHECKED BY:

USCS symbol

DATE: 8/4/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN BOX (PLUG)	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	68.0 TO 70.5		ϕ								NO SAMPLE
BOX 8 of 8	70.5 TO 72.0		(2) 1.0						71		FINE GRAINED SANDSTONE - LT GREY (N8), MASSIVE BEDDING, WELL WEATHERED, WELL SORTED, SOME IRON STAINING MOTTLED, TRACE OF CARBONACEOUS MATERIAL, WAVY BEDDING AT 70° WITH CLAY INFILLING
	72.0 TO 73.5		(1) 1.0						72		FINE GRAINED SANDY CLAYSTONE - LIGHT GREY (N7), MASSIVE BEDDING, WELL WEATHERED, MOD FRIABLE, TRACE OF ORGANIC MATERIAL
	73.5 TO 74.5		ND						73		SILTY CLAYSTONE - LIGHT GREY (N7), MASSIVE BEDDING, WELL WEATHERED, MOD FRIABLE, SOME ORGANIC MATERIAL, FG SAND OCCURS IN POCKETS
									74		
											BOTTOM OF BOXES
									75		
									76		
									77		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 37-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 8/1/89
CHECKED BY:
DATE:

USCS SYMBOL

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (FT/SEC/CM)	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 to 2.0		(1) 1.3	GC				>50% Gravel	1		Gravel, very light gray (N8) to medium light gray (N6), angular to subrounded, poorly graded to moderately graded, max size 5 cm, some clay, brownish gray (5 YR 4/1), clay matrix has a calcareous component. Clay grades to moderate reddish brown (10 R 4/6) with trace of silt and sand below 2.0 ft.
	2.0 to 4.0		ND						2, 3		
	4.0 to 7.0		(1) 1.0						4, 5, 6		As above but clay matrix is coupled with caliche below 4.0 ft.
	7.0 to 7.5		ND	CL				>50% Clay	7, 8, 9		Clay/Caliche - very light gray (N8) / white (N9), clay exhibits moderate plasticity
	7.5 to 9.5		ND								DCB

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO.

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 8/1/89
CHECKED BY:
DATE:

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (IN FEET)	SAMPLE NUMBER	FEET OF CORE IN BOX (IN FEET)	FEET OF CORE IN ROW	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
2 Box 1 of 2	9 5 to		~~7.5~~ DCB					>50%			DCB
11.5	11 5		ND	CL					11		DCB ~~As above~~
11 5 Box 2 of 2									12		Clay yellowish gray (5Y 7/2), high plasticity, localized carbonate mineralization
13 0									13		
									14		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 3427-87A

PAGE 1 OF 1

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: [illegible]
CHECKED BY:
DATE:

USCS SYMBOL

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (FT/FT)	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE IN ROW	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	2.0 to 5		ND	GC				750' Gravel	1		Gravel, light gray (N7), angular to subrounded, moderately graded, max size 4.5 cm, some clay and caliche, some plant debris in upper .3 ft
	15.40 17		ND								NO SAMPLE
	17.40 20		DCB 0						DCB 2		At 1.4 ft. [illegible] caliche matrix [illegible] as above.
	2.0 10 3.4		ND						2		
	3.4 40 39		ND								
	39.40		0						4		NO SAMPLE
	1.0 to 5.7		ND	CL				60' Cl, 40' Gravel	5		Gravelly Clay, [illegible] (10 YR 7/4), moderately plastic, ~~some silt~~ calcareous, some silt, localized carbonate mineralization
									6		Bottom of Box 1/7 at 5.7 ft
									7		
									8		
									9		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 37-87 'Original Hole'

PAGE 1 OF 1

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 8/1/89
CHECKED BY:
DATE:

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW	SAMPLE NUMBER	FEET OF CORE	USCS symbol	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 V	0-0 to 1.0		(1) 1.2	GM				>50' Gravel	1	0 0 0 0 0 0	Gravel, light gray (N7), angular, moderate to poor grading, max size 5 cm sandstone, silt and sand, matrix has calcareous component.
	1.0 to 4.0		(1) 1.6						2, 3	0 0 0 0 0	
	4.0 to 7.0		(1) .65	GC				>50' Gravel	4, 5, 6	0 0 0 0 0 0	As above, with [illegible] clay [illegible] matrix [illegible] DCB Clayey Gravel, light gray (N7), angular, poorly sorted, max size 7 cm, clay matrix is moderate, yellowish brown (10 YR 5/4) and has a calcareous component
	7.0 to 9.5 DCB		.4						7, 8, 9	0 0 0 0 0 0	
	9.5 to [illegible]		0	X				X		X	No Sample

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 37-87

GEOLOGIST(S): [illegible]
DATE: 8/28/89

PROJECT NO: 6667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0-2.0	(1) 1.2				45% GRAVEL 55% SAND	GC	1		GRAVELLY SAND, pale yellowish brown (10 YR 6/2), angular-subangular, mod-well grading, sand is VFG-MG, max gravel size 4 cm, ~~[illegible]~~ calcareous, some clay
	2.0-4.0	(1) 1.1				45% GRAVEL 55% SAND	GC	2, 3		Same as above: very pale orange (10 YR 8/2), increased amt of calcareous material
	4.0-7.0	(1) 1.4				45% GRAVEL 55% SAND	GC	4, 5, 6		Same as above, grayish orange (10 YR 7/4)
	7.0-11.0	(1) 1.5				25% CLAY 35% GRAVEL 40% SAND	SC	7, 8, 9		CLAYEY GRAVELLY SAND ~~CLAY~~, grayish orange (10 YR 7/4), angular-subangular, mod grading, sand is ~~[illegible]~~ FG-CG, max gravel size = 4 cm, calcareous

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 37-87

GEOLOGIST(S): DAY
DATE: 8/28/89

PROJECT NO: 6607-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
										See Previous page
12.3 ↑	11.0 - 12.3	∅						11 – 12		JAR SAMPLES
DISCREPANCY BETWEEN BOXES								13 – 14 – 15 – 16 – 17 – 18		NO SAMPLE
18.0 ↓ Box 2 of 3	18.0 - 21.7	∅						19		NO SAMPLE

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 37-87

GEOLOGIST(S): DAY
DATE: 8/28/87

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
		Ø				~~30% SAND 70% clay~~		21		NO SAMPLE
Box 2 of 3	21.7 -23.0	(2) 3.6				30% SAND 70% clay		22		SANDY CLAYSTONE, grayish orange (10 YR 7/4) and very light gray (N8), possibly 10° laminar bedding, highly weathered, mod friable, some non staining, some mg staining, sand is VFG-FG, some silt
	23.0 -25.0	1.9				40% SAND 60% clay		23, 24		Same as above: dark yellowish orange, increased sand fraction, bedding is non-apparent in TOP 1 FT, possibly horizontal laminar bedding in bottom of interval
↑ 25.5	25.0 -25.5	Ø						25		NO SAMPLE
25.5 ↓ Box 3 of 3 ↑ 28.0								26, 27		Same as above: grayish orange (10 YR 7/4) and very light gray (N8), decreased sand fraction, bedding is non-apparent
End of Boxes								28, 29		

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 38-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD
DATE:
CHECKED BY:

USCS symbol

DATE: 8/8/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN SCALE	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 TO 2.0		1.05 (1)						1		Cliche - very pale orange (10YR 8/2), some sand & gravel (max size ≈6cm, trace clay & roots
	2.0 TO 4.0		0.8 (1)	GC					2, 3		Gravel - matrix is grayish brown (5YR 3/2), angular to subangular, mod-well ~~sor~~ graded, max size = 6cm some clay & sand, becoming calcareous at bottom of interval
Box 1 of 2	4.0 TO 7.0		0.95 (1)						4, 5, 6		Cliche - very pale orange (10YR 8/2), some sand & gravel (max size ≈5cm) trace clay.
	7.0 TO 10.0		ND	CL					7, 8, 9		Same as above; less sand & gravel. (TOP 10" of interval) Next 1.75 ft. consists of cliche - white (N9), some clay in pockets this grades into silty clay - lt gray & cliche - white (N9), trace FG, sand, med plast. becoming more clay at bottom of interval

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 38-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD
DATE:
CHECKED BY:

USCS symbol

DATE: 8/8/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN BOX (IN FEET)	SAMPLE NUMBER	FEET OF CORE	USCS symbol	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
12.4 → Box 1 of 2	10.0 TO 12.4		ND	CL					11, 12		Silty clay - mottled lt. gray (N7) & dark yellowish orange (10YR 6/6) (becomes more dk yellowish orange below top 8" of sample), med - high plasticity, calcareous in top 8" of sample; becoming slightly calcareous, trace of V.F.G. sand & carb. staining.
12.4 ↓ Box 2 of 2	12.4 TO 14.0		ND	CL					13, 14		Same as above (description below top 8")
15.2	14.0 TO 15.2		VD	CL					15		Same as above; no CaCO3 or carb. staining.
									16, 17, 18, 19		Bottom of Boxes

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 38-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TJO
DATE:
CHECKED BY: DATE: 8/2/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BIT	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0 0 ↓	0 0 TO 1 3		1.0 (1)	GW					1		Gravel - predominantly pinkish gray (5YR 8/1), subangular to subrounded, mod. grading, max size = 6 cm, trace of sand, silt, & clay, bottom 3" of interval have some clay & calcite. (clay matrix is dark yellowish brown (10YR 4/2).
	1.3 TO 2 0		0	—					2		NO SAMPLE
	2 0 TO 3.1		0.55 (1)	SW					3		Calcareous F.g. to med. V.C.G. sand very pale orange (10YR 8/2) to dark yellowish orange (10YR 6/6), sub-rounded to rounded, well graded, some gravel (max size = 4 cm)
	3.1 TO 4.0		0	—					4		No Sample
	4 0 - 4 6		ND	GC							Clayey gravel - variegated predominantly med lt gray (N6), angular to subrounded, poorly graded, some sand, very calcareous. (max size = 4 5 cm)
	4.6 TO 5.75		ND	SW					5		Same as 2.0 to 3.1 description max gravel size = 6 5 cm
	5 75 TO 7 0		0	—					6 7		No Sample
	7.0 TO 8.0		ND	GP							Gravel - med. lt gray (N6) sub-angular to subrounded, poorly graded, max size = 7.5 cm, calcareous, trace of sand & clay
	8.0 TO 9 5		0	—					8 9		NO SAMPLE
	9 5 - 10 15		0.2 (1)	GP							Same as above, max size = 5 cm

BOX 1 of 1

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH38-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD
DATE:
CHECKED BY: DATE: 8/2/89

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE RECOVERED	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	10.15 TO 10.85		(1) 0.3	GP							Gravel - med light gray (N6) subrounded, poorly graded, max size = 7cm, trace of sand, clay & calcite.
	10.85 TO 14.4		0						11, 12, 13, 14		NO SAMPLE
	14.4-14.6		ND								SAME as above; increased clay
BOX 1 of 5	14.6 TO 16.4		0						15, 16		NO SAMPLE
	16.4-16.6		ND								~~Silty~~ Sandy (FG) siltstone - very pale orange (10YR 8/2) & pale yellowish orange (10YR 8/6) - mottles, highly weathered mod. friable
	16.6 TO 18.4		0						17, 18		
↑ 18.8	18.4-18.8		ND								SAME as above
	18.8 TO 20.4								19		NO Sample

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH38-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TBD
DATE:
CHECKED BY: DATE: 8/2/89

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE RECOVERED	FEET OF CORE IN BOX	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
20.4 ↓	20.4 TO 21.8		(2) 0.6					21		claystone - mottled light olive gray (5Y 6/1) + Dark yellowish orange (10YR 6/6), occasional silt in thin layers, limonite staining in fractures, trace of carbonaceous staining, massive bedding, moderately friable, weathered,
↑ Box 2 of 2	21.8 TO 23.4		NO					22		
23.4								23		Same as above
										bottom of Boxes
								24		
								25		
								26		
								27		
								28		
								29		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 39-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY: DATE: 7/26/89

PROJECT NO. 667-11.22

USCS Symbol

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE	SAMPLE NUMBER	FEET OF CORE	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 to 20	*	16 (1)	GW					1		Gravel. Predominantly light gray to medium dark gray (N7 to N4) Angular well graded Maximum size - 9cm long. Clay, dark reddish brown (10R 3/4) with fine to coarse grain sand, silt.
	20 to 40		1.1 (1) ~~1.8~~	GW					2, 3		Gravel Predominantly light gray to med dark gray (N7 to N4) Some moderate pink (5R 7/4) Angular to subrounded well graded Max size 6cm Some ~~sandy~~ Clayey ~~Clay~~ sand: light brown (5yr 5/6). Well graded, fine to very coarse grained. Angular to sub rounded Some HCl reaction - some calcareous precipitation
Box 1 of 2	40 to 70		.65 (1)	GW					4, 5, 6		Gravel Predominantly light gray to med dark gray (N7 to N4) Angular to subrounded well graded. Max size 7.5 cm Some sand + silt Color too varied to describe accurately Fine to very coarse grained. Angular to sub-rounded Some calcareous mineralization. Strong HCl reaction
	70 to 95		1.85 (1)	GW					7, 8, 9		Same as above, Clayey Sand is light brown (5yr 5/6)

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

BB Box 1: 50-100 cpm

LOG OF BORING NO. BH 39-87

DATES DRILLED
ELEVATION
GEOLOGIST(S) WAA
DATE
CHECKED BY. DATE. 7/26/89

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FOOT INTERVAL	SAMPLE NUMBER	FEET OF CORE IN FOOT INTERVAL	USCS SYMBOL ~~FEET OF CORE AT RUN~~	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 2	9.5 to 12.0		1.5 (1)	GW				11		Same as above
	12.0 to 14.05		1.0 (1)	GW				12, 13, 14		Same as above
14.5 ↑										
New Box ↓ 14.5 ↓ Box 2 of 2	14.5 to 17.0		1.9 (1)	ML				15, 16		~~Silty Sandstone~~ Siltstone Moderate brown to moderate reddish brown (10R4/6) to (5yr 3/4). Possibly convoluted ~~bedding~~ and/or zonal. Highly weathered Non- to slightly friable. ~~Very fine grained, well sorted~~ Some mineralization n' fractures. Grades to grayish orange ~~silty sandstone~~ clayey siltstone to fine sandstone (10yr 7/4) Looks like thin horizontal bedding weathered moderately friable. Very fine grained. well sorted
	17.0 to 19.5		~~1.9~~ 2.8 (1)	ML				17, 18, 19		Same as above, also has dark yellowish orange coloring
	19.5 ↓									

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

BH Box 2: 50-100 cpm.

LOG OF BORING NO. BH 39-87

DATES DRILLED:
ELEVATION
GEOLOGIST(S) CAA
DATE
CHECKED BY.

USCS symbol

DATE: 7/26/89

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (interval)	SAMPLE NUMBER	FEET OF CORE IN BOX (interval)	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	19.5 to 22.0		1.7(1)	ML			~~M~~	clay ≈ 38%	21		clayey siltstone Same as above, ~~some~~ trace carbonaceous material throughout matrix
									22		Bottom of Boxes

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 39-87.BR(SP08-87)

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:
USCS symbol
DATE: 8/7/89
PROJECT NO: 667-11.22

Top/Bottom of Core in Box	Top/Bottom of Core in Box	Sample Number	Feet of Core	Feet of Core	Fractures per Foot	Fracture Angle	Bedding Angle	Grain Size Distribution	Depth in Feet	Lithologic Log	Lithologic Description
0 0 ↓ Box 1 of	0 0 to 2.0		.7 (1)	GC				grav >50%	1		Clayey gravel. Gravel med lt gray (N6). Angular to subrounded Mod. well graded Max size 4 cm Silty clay matrix Dark yellowish brown (10yr 4/2) Est plasticity, mod to high Very slightly calcareous Trace root material.
	2.0 to 3.5		1.05 (1)	CL				Clay >50%	2, 3		Gravelly Clay. Mod brown (5yr 4/4). Est plasticity Moderate. Some med grained Sand. Gravel Small (5 cm) to lg (7 cm) angular to subrounded Well graded Clay Pale yellowish orange (10yr 8/6) Est plast mod to high Some sand - coarse to fine
	3.5 to 6.5		2.45 (1)	CL				Clay >80% Silt ≈30%	4, 5, 6		Clay yellowish gray (5y 8/1) Est. plast mod to high Trace fine sand Some CaCO3. Some iron staining lower in interval Becoming silty toward bottom
	6.5 to 9.0		.75	CL				Clay >50%	7, 8		Silty clay. Very pale orange (10yr 8/2). Est plast. low to mod Some iron staining
	9.0 to		1.0 (1)	CL				Clay >50%	9		Same as above

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 39-87BR (SP08-87)

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:
DATE: 8/7/89
PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
									11		See previous page for description.
Box 1 of ↑ 14.0	11.5 to 14.0		.7	CL				Clay >50%	12, 13		Silty clay. Very pale orange (10yr 8/2) Est plast low to mod Some iron staining. Trace v.f. grained sand.
Box 2 of	14.0 to 16.5		1.4 (1)					Clay >50%	14, 15, 16		Silty claystone. Grayish orange (10yr 7/4) to yellowish gray (5y 8/1). Bedding not apparent Highly weathered, slightly to mod friable Trace gravel, carb. material — Begin Fr 2 ↓
	16.5 to 19.0		1.9 (1)					Clay >50%	17, 18		Silty claystone. Dk yellowish orange (10yr 6/6) Highly weathered Mod to highly friable Some iron staining Trace carb material. Color change @ bottom to very pale orange, (10yr 8/2).
	19.0		~~Stuff~~					Clay >50%	19		Silty claystone, yellowish gray to lt olive gray (5y 8/1 to 6/1) Bedding not evident Highly weathered Mod friable Some iron staining.

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 39-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:

USCS symbol

DATE: 8/7/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROCK (IN FEET)	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of	19.0		1.25 (1)						21		See previous page for description
	21.5 / 21.5		1.9 (1)					Clay >50%	22, 23		Silty claystone yellowish gray to lt. olive gray. (5y 3/1 to 6/1) Bedding not evident Highly weathered Mod friable. Some iron staining
	24.0 / 24.0		1.45					Clay >50%	24, 25, 26		* Claystone. Dk yellowish orange (10yr 6/6) Bedding not evident Highly weathered, mod friable Some carb material. Trace silt. *
	26.5 / 26.5								27, 28, 29		* See Next Page — Begin New Box

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

* This interval overlaps from one box to another, next page describes Box 3 of 4 in overlapping interval.

LOG OF BORING NO. 39-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): UAA
DATE:
CHECKED BY: DATE: 8/8/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN FEET	TOP/BOTTOM OF BOX IN FEET	SAMPLE NUMBER	FEET OF CORE RECOVERED	FEET OF CORE LOST	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
									21, 22, 23, 24		See Previous Page
	24.5 / 24.5										
	25.2 / 25.2		1.0(1)					Clay >50%	25		Claystone Pinkish gray (5yr 8/1) and pale yellowish orange (10yr 8/6) Bedding not evident Highly weathered Mod. Friability. Some carb material. Some iron staining
	26.5 / 26.5		~~2.8~~ UA					Clay >50%	26		Claystone. As above, color chrome to pale yellowish brown (10yr 6/2).
Box 3 of 4	29.0 / 29.0		2.8(1)					Clay >50%	27, 28, 29		Claystone. Pale yellowish brown (10yr 6/2) Bedding not evident. Highly weathered. Mod. to highly friable Some iron staining Trace $CaCO_3$
			1.25(1)					Clay >50%			Same as above

Begin Box 3 ↓

and Dk yellowish orange (10yr

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 39-87.BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): UAA
DATE:
CHECKED BY:
DATE: 8/8/89
PROJECT NO: 667-11.22

Top/Bottom of Core in Box	Top/Bottom of Core in Box (in feet)	Sample Number	Feet of Core (Inches)	Feet of Core (Inches)	Fractures per Foot	Fracture Angle	Bedding Angle	Drain Size Distribution	Depth in Feet	Lithologic Log	Lithologic Description
											See description on previous page
									31		
	31.5 / 31.5							Clay >50%	32		Claystone. Pale yellowish brown (10yr 5/2) to Dk. yellowish orange (10yr 6/6) Bedding not evident Highly weathered mod to highly friable. Trace CaCo3, Trace carb material trace silt
			2.25(1)						33		
	34.0 / 34.0							Clay >50%	34		Same as above
			1.6(1)						35		
35.8 / 36.5	35.8 / 36.5		.8(1)					Clay >50%	36		Claystone Pale yellowish brown (10yr 6/2) to dk yellowish orange (10yr 6/6) Same as above
	36.5								37		Same as above slightly more silt.
			1.85(1)					Clay >50%	38		
	39.0 / 39.0		2.0(1)					Clay >50%	39		Claystone as above, lt brownish gray (5yr 6/1).

Box 3 of 4

Box 4 of 4

Boxes 35.8 to 36.5

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 39-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:

USCS symbol

DATE: 8/8/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 4 of 4	39.0 to 41.5		2.0 (1)					Clay >50%	41		Claystone Lt. brownish gray (5yr 6/1). Bedding not evident. Highly weathered mod. to highly friable. Some silt. Trace carb. material.
	41.5 to 44.0		1.25 (1)					Clay >50%	42, 43, 44		Same as above
									45, 46, 47, 48, 49		Bottom of Boxes

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 39-87BR

DATES DRILLED
ELEVATION
GEOLOGIST(S) TSD/DCB
DATE
CHECKED BY
DATE 7/20/89

USCS symbol

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (interval)	SAMPLE NUMBER	FEET OF CORE IN BOX (interval)	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
									41		
41.3 ↓	41.3 TO 44.03		1.4 (2)	—				>50' clay	42, 43		claystone medium gray (N5) thin horizontal bedding approximatly 1-3 mm thick, highly weathered, moderately friable, some carbonaceous material throughout, trace of iron oxide staining.
	44.03 TO 45.4		0.4 (1)	—				"	44, 45		Same as above, trace of fine sand on bedding plane
Box 1 of 11	45.4 TO 47.0		1.8 (2)					"	46, 47		Same as above (44.03 TO 45.4)
	47.0 TO 49.03		1.85 (2)					"	48, 49		Same as above
	49.03 TO 49.5		0.45 (2)					"			Same as above
	49.5 TO 50.7		1.2 (1)					"			Same as above

NOTES General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 39-87DR

DATES DRILLED
ELEVATION
GEOLOGIST(S) DCB/TSD
DATE 7/20/89
CHECKED BY DATE

PROJECT NO 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN INTERVAL	SAMPLE NUMBER	FEET OF CORE IN BOX	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION (USCS symbol)	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 11	49.5 to 50.7						>50% Clay			As above (see page 1)
	50.7 to 52.8						>50% Clay	51, 52		Claystone, medium gray (N5), thin horizontal bedding w/ 1 to 3 cm thickness, highly weathered, moderately friable, localized carbonaceous mineralization occurs on bedding plane partings (plant remains?), localized iron oxide stains. DCB
52.8	52.8 to 54	1.2					"	53, 54		As above
Box 2 of 11	54 to 55.85						"	55		As above. Note: a .5 ft. interval is marked in the core box from 54 ft to 54 ft. *
	55.85 to 57.0						"	56		As above
	57.0 to 57.3						"	57		As above
	57.3 to 59.03						"	58, 59		As above
	59.03 to 61.0						"			As above

NOTES. General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

38 Box 2/11 50-200

LOG OF BORING NO. 39-87BR

DATES DRILLED
ELEVATION
GEOLOGIST(S) TSQ/DCB
DATE
CHECKED BY DATE 7/20/89

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION (USCS symbol)	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
								>50% clay			As above
61.0 ↓	61.0 TO 65.0		0						61, 62, 63, 64		Claystone medium gray (N5) bedding not apparent, highly weathered, moderately friable some carbonaceous material throughout, trace of iron oxide staining. One fracture observed. No Sample
	65.0 TO 66.0		(1) 1.48		1/1	30°		clay >50%	65		Above description is for the interval from 65.0 to 66.0
	66.0 TO 66.2		0.2 (1)					"	66		Same as above no fractures
BOR 3 ch 0	66.2 TO 67.5		(2) 1.8					"	67		1st 1/2 foot of interval is the same as above. The bottom 1/4 foot the middle is a shaly carbonaceous material grayish black (N2) to black (N1) ~~some~~ trace of clay
	67.5 TO 69.4		(2) 1.88					"	68, 69		Carbonaceous claystone - grayish black (N2) to black (N1), Thin horizontal bedding, 1 to 3mm thick, highly weathered, moderately friable. Same as above but is ~~displays~~ shaley ~~characteristics~~ & has a trace of fine sand.
	69.4 TO 70.0		(1) 1.48					1/			

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

βγ Background
βγ = 200-250

LOG OF BORING NO. 39-87 DR

~~DATES DRILLED~~
~~ELEVATION~~
GEOLOGIST(S) DCB/TSD
DATE 7/20/87
CHECKED BY
DATE

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (interval)	SAMPLE NUMBER	FEET OF CORE IN BOX (interval)	~~FEET OF CORE IN RUN~~ USCS symbol	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	70.0 to 70.6		.4				750' clay			As above (see page 3)
Bot 3 of 11	70.6 – 72.15		0					71, 72		No Sample
73.45	72.15 – 73.45		1.3 (2)				750' Clay	73		As above reference interval 69.4 to 70.0 page 3
73.45	73.45 to 74.1		.7				"	74		As above
	74.1 to 76		1.9				"	75		As above
Bot 4 of 11	76 to 77.3		.6 (1)				"	76, 77		As above - slickenside occurs at approximately 76.2 ft oriented vertically, surface is glossy with linear striations and no mineralization.
	77.3 to 78.13		1.35 (2)				"	78		~~As above~~ OCB claystone olive gray (5 Y 4/1), thin bedded (1 to 2mm), weathered, ~~friable~~ moderately friable, black carbonaceous mineralization along bedding plane, partings, siltstone inclusions, lensoidal [illegible]
	78.13 to 80		.55 (2)				"	79		As above

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 39-87BR

DATES DRILLED
ELEVATION
GEOLOGIST(S) TSD/OCB
DATE
CHECKED BY DATE 7/20/87

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION (USCS SYMBOL)	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
BOX 4 of	80.0 TO 81.28		(2) 1.5				>50% clay	81		Claystone medium gray (N5) highly weathered, moderately friable, thinly bedded (≈1 mm thick) some carbonaceous material, trace of very fine sand lens as near the bottom of interval, displays localized shaley characteristics
	81.28 TO 82.0		(2) 0.57				"	82		Same as above except fine sand lenses are throughout, but NONCONTINUOUS
	82.0 TO 83.0		(2) 1.2				"			Same as above
83.0	83.0 TO 89.0		(2) 1.00		1/1 40°		"	83		Same as above with bedding ≅ 1mm TO 3mm, an increase amount of V. fine sand inclusions/silt inclusions & carbonaceous material trace of iron staining in fractures.
	84.0 TO 84.8		(2) 0.75				"	84		Claystone medium gray (N5) highly weathered, moderately friable thinly bedded (1mm TO 6mm) some very fine sand TO silty lenticular bedding, some carbonaceous material.
BOX 5 of	84.8 TO 86.0		(2) 1.15					85		Same as above with bedding ranging from <1mm TO 3mm thick + sand & silt occuring in lenses shaley
	86.0 TO 86.45		0.45 (2)					86		Same as above
	86.45 TO 88.0		(2) 1.52		1/1.5 10°		"	87		Same as above w/iron staining in fracture.
	88.0 TO 88.2		0.15 (2)				"	88		Same as above no obvious fractures
90.1	88.2 TO 90.1		(2) 1.94		1/2 45°		"	89		Same as above with an increase in the amount of sand + silt, & these components appear lenticular trace of iron staining.

NOTES General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 39-87OR

DATES DRILLED
ELEVATION
GEOLOGIST(S) TJD
DATE
CHECKED BY DATE 7/20/88

PROJECT NO 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION (USCS symbol)	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
								91		NO Sample
92.0 ↓	92.0 TO 93.85						>50 clay	92, 93		Silty claystone medium gray (N5) highly weathered, thin horizontal bedding (<1mm to ≈1mm), moderately friable, some carbonaceous material v. fine grained sand + silt lenticular bedding, trace of iron staining. shaley.
	93.85 TO 95.5							94, 95		Same as above
BOX 6 of	95.5 TO 96.0									Same as above
	96.0 TO 97.15							96, 97		Clayey Siltstone medium light gray (N6) Thin horizontal bedding (<1mm to 3) highly weathered moderately friable, some carbonaceous material & fine sand. shaley
	97.15 TO 98.85							98		Same as above
	98.85 TO 100.0							99		Silty claystone medium gray (N5) Thinly bedded (horizontal) (<1mm to 1mm) moderately friable, some carbonaceous material & fine sand to silt lenticular bedding, trace of iron staining shaley

NOTES General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 39-87OR

DATES DRILLED
ELEVATION
GEOLOGIST(S) TSO/GCE
DATE 7/21/89
CHECKED BY DATE 7/21/89

PROJECT NO 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN POT INTERVAL	SAMPLE NUMBER	FEET OF CORE IN BOX	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION (USCS symbol)	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
100.0 ↓	100.0 TO 101.5		1.5 (2)					>50% Clay	101		CLAYSTONE, MEDIUM GRAY (N5) THIN HORIZONTAL BEDDING (1-2 mm), HIGHLY WEATHERED, MODERATELY FRIABLE, TRACE OF CARBONACEOUS MAT'L, SOME VERY FINE SAND AND SILT, LENTICULAR BEDDING (INCREASING AT BOTTOM OF INTERVAL)
	101.5 TO 102.6		1.15 (2)					"	102		(SAME AS ABOVE) WITH INCREASED CARBONACEOUS MAT'L W/ NO LENTICULAR BEDDING, TRACE OF IRON STAINING SAND LENSES
	102.6 TO 104.65		1.66 (2)					"	103 104		SAME AS ABOVE
BOX 7 OF	104.65 TO 106.2		1.85 (2)		1/FT	< 60°		"	105 106		TOP HALF OF INTERVAL SAME AS ABOVE, BOTTOM HALF CONSISTS OF A CARBONACEOUS CLAYSTONE, DARK GREY (N3) SHALEY, HIGHLY WEATHERED, MODERATELY FRIABLE, TRACE OF IRON STAINING,
	106.2 TO 108.0		1.85 (2)					"	107 108		(SAME AS ABOVE)
↑ 109.7	108.0 TO 109.7		1.85 (2)					"	109		SILTY CLAYSTONE, MEDIUM DARK GREY (N4) TO DARK GREY (N5), HORIZONTAL BEDDING (THIN TO MASSIVE), SOME CARBONACEOUS MATERIAL, TRACE OF VERY FINE SAND,
109.7											

NOTES. General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

βγ background = 30-90
βγ BOX 7 = 50-210 cpm
βγ BOX 8 = 50-250 cpm

LOG OF BORING NO. 39 87BR

DATES DRILLED
ELEVATION
GEOLOGIST(S) TSD
DATE
CHECKED BY.
DATE 7/21/89

USCS SYMBOL

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
↓	109.7 TO 111.35		(1) 1.75				>50 silt bdd 110G	111		Top 3" same as above. Very fine sandy siltstone very light gray (N8) massive bedding highly weathered, slightly friable, trace of carbonaceous material
	111.35 TO 111.9		(2) 0.55				"			Same as above w/ an increase in carbonaceous material.
	111.9 to 112		0.33(1)				[illegible]	112		Claystone, medium gray (N5) highly weathered, moderately friable some carbonaceous material
	112.0 TO 112.6		(1) 0.7				>50 clay			same as above w/ some V-fine sand & silt layers.
	112.0 TO 114.16		(2) 1.65				>50' silt	113 / 114		very fine sandy siltstone very light gray (N8), massively bedded?, highly weathered, slightly friable, some carbonaceous material & v fine sand occurring in lenticular bedding.
	114.16 TO 116.0		(2) 1.82				"	115		Same as above w/ a trace of iron staining.
Box 8 of — ↑ 118.0	116.0 TO 118.0		(1) 1.7				"	116 / 117 / 118		Same as above w/ some clay. Stone is shaley & moderately friable.
118.0 ↓ Box 9 of —	118.0 TO 119.4		(2) 1.14				>50' clay	119		Claystone medium gray (N5) Thin horizontal bedding (<1mm to ?) shaley, highly weathered, moderately friable, some carbonaceous material, trace of silt & iron staining.
	119.4 TO 120.0		(2) 0.55				"			Same as above

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(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 39-87BR

DATES DRILLED:
ELEVATION
GEOLOGIST(S): TSD
DATE
CHECKED BY.

DATE: 7/21/87

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (in/ft/yd)	SAMPLE NUMBER	FEET OF CORE IN BOX (in/ft/yd)	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
BOX 9 of —	120.0 TO 121.0		11 (2)					>50' clay	121		Silty claystone light olive gray (5Y6/1) Thin horizontal bedding highly weathered, moderately friable shaley, trace of carbonaceous material & iron staining
	121.0 TO 122.0		1.22 (2)					>50' silt	122		V. fine sandy siltstone light olive gray (5Y6/1) Thin horizontal bedding (<1mm to 1mm), highly weathered slightly friable, trace of carbonaceous material fine sand occurs in a thin lense near the bottom of the interval.
	122.0 TO 122.25		0.3 (1)					"			Same as above.
	122.25 TO 124.2		1.93 (2)					"	123 / 124		Same as above.
126.0	124.2 TO 126.0		1.95 (2)					"	125 / 126		Clayey siltstone olive gray (5Y 2/1) Thin horizontal bedding (1mm to 3mm) highly weathered slightly friable, V. fine sand occurs in lenses, some carbonaceous material, trace of iron staining small 3in section in center of run thats a claystone, shaley & moderately friable
126.0	126.0 TO 127.5		(2)(1) 1.55					"	127		V fine sandy siltstone light olive gray (5Y6/1) Thin horizontal bedding (<1mm to 1mm) highly weathered slightly to moderately friable, some claystone & carbonaceous material
BOX 10 of —	127.5 TO 129.2		1.75 (1)					"	128 / 129		Same as above less sand.
	129.2 TO 130.0		1.05 (1)					>50' clay			Silty claystone light olive gray (5Y6/1) massively bedded to shaley highly weathered, moderately friable, trace of carbonaceous material

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

βd = BOX 10 = 50-200 cpm

LOG OF BORING NO. 39-87BR

DATES DRILLED:
ELEVATION
GEOLOGIST(S) TSD
DATE
CHECKED BY.
DATE. 7/21/89

USCS symbol

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	130.0 TO 130.63		0.65 (2)					>50' silt			clayey siltstone - greenish gray (5GY 6/1), massively bedded ? to thin bedding highly weathered, slightly friable
Box 10 of	130.63 TO 132.0		1.02 (2)					"	131		V. fine sandy siltstone - greenish gray (5GY 6/1), massive bedding?, highly weathered, slightly friable, some clay, trace of carbonaceous material
	132.0 TO 132.7		0.67 (2)					"	132		Same as above.
134.3	132.7 TO 134.3		1.75 (2)					>50' clay [illegible] 133.5	133 / 134		Top 1/2 of interval is same as above, It grades into a silty claystone, shaley, highly weathered olive gray (5Y 4/1) moderately friable, some carbonaceous material
134.3	134.3 TO 136.0							>50' clay	135		Claystone - greenish gray (5GY 6/1), shaley, highly weathered moderately friable, trace of silt & carbonaceous material
Box 11 of 138.0	136.0 TO 138.0							"	136 / 137		Top 1/2 of interval is same as above, 2nd 1/2 of interval becomes highly carbonaceous & shaley, & approaches highly friable.
									138 / 139		Bottom of bores

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 40-87

DATES DRILLED
ELEVATION
GEOLOGIST(S): UAA
DATE
CHECKED BY.
DATE. 7/24/89

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (interval)	SAMPLE NUMBER	FEET OF CORE IN BOX (interval)	USCS symbol ~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 to 0.6		0.5	CL				Clay >50%			Clayey silt Light brownish gray (5yr 6/1). Abundant roots & grass Some iron staining throughout matrix
	0.6 to 4.0		0						1, 2, 3, 4		No Sample
Box 1 of 2	4.0 to 6.2		2.1 (1)					Gravel 50% Clay 50% Gravel 30% Silt 30%	5, 6		Top 0.5 ft of interval Gravel Medium gray (N5) Angular to subangular Well graded. Some clay and silt Trace iron staining Rest of interval: Clayey, gravelly silt Light gray to lightolive gray (N7 to 5y 6/1) Gravel to 3cm Subrounded Abundant iron staining throughout matrix Could be highly weathered gravelly siltstone Incomplete ~~and~~ induration.
	6.2 to 7.5		ND (2)				wt	Clay ~~>30%~~ >50%	7		Clayey siltstone Very pale orange to grayish orange (10yr 8/2 to 10yr 7/4). Massive bedding(?) Highly weathered. Some calcareous mineralization Some iron staining. Friable in places Trace carbonaceous material.
	7.5 to 8.0		0						8		No Sample
↑ 11.8	8.0 to 10.5		N.D (2)				wt	Clay >30% >50%	9		Same as above, more carbonaceous material at bottom occuring in very thin harlike layers

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

βγ - Box 1 - 100-150 cpm

LOG OF BORING NO. 40-87

DATES DRILLED:
ELEVATION
GEOLOGIST(S) LAA
DATE
CHECKED BY.
DATE. 7/24/89

USCS symbol

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (interval)	SAMPLE NUMBER	FEET OF CORE IN BOX (interval)	~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 2 ~~10.5 to 11.8~~ 11.8	↑ 10.5										
	10.5 to 11.8		2.0 (1)					Clay >50%	11		Same as above with color change to pale yellowish brown. Extremely weathered, extremely friable
11.8 Box 2 of 2 13.0	11.8 to 13.0		N.D. (1)					Clay >50%	12		Same as above
									13		Bottom of Box
									14		
									15		
									16		
									17		
									18		
									19		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

BY-(Box)-100cpm

LOG OF BORING NO. DH 40-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S) DCB
DATE 7/26/89
CHECKED BY:
DATE:

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (INTERVAL)	SAMPLE NUMBER	FEET OF CORE (INTERVAL)	USCS SYMBOL ~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 to 2.0		(1) 1.6	GP				>50% Gravel	1		Gravel grayish ~~pink~~ DCB orange pink, (10 R 8/2), subangular to subrounded poorly graded, max size 6cm, some grass and roots in upper .1 ft., some clay at approximately 1 ft.
	2.0 to 4.0		(1) ~~1~~.3 DCB						2, 3		~~Ang~~ DCB Interval changes to gravel and caliche below 1.6 ft. – Gravel, medium gray (N6), angular to subangular, well graded, some caliche
Box 1 of 2	4.0 to 7.0		(1) 2.3						4, 5, 6		
	7.0 to 9.5		(1) 1.7	CL					7, 8, 9		Interval changes to clay at 8.0 ft. – Clay, very light gray (N8), high plasticity, trace of silt and gravel.
	9.5 to 12.0		ND								At 9.5 ft. interval grades to siltstone – clayey siltstone, yellowish

NOTES. General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 40-87

DATES DRILLED
ELEVATION
GEOLOGIST(S): DCB
DATE 7/26/89
CHECKED BY:

USCS symbol

DATE:

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN BOX (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
↑ 12.0	9.5 to 12.0		ND						11		gray (5Y 8/1), bedding not apparent, highly weathered, moderately friable, abundant very fine sand, localized iron staining, localized carbonate mineralization
2 of 2 Box ↑ 14.5	12.0 to 14.5		ND						12, 13, 14		
									15		Bottom of Box 2 of 2 at 14.5

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 41-87 BR

DATES DRILLED
ELEVATION:
GEOLOGIST(S): TSD, LAA
DATE:
CHECKED BY: DATE: 7/24/89

USCS symbol

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (interval)	SAMPLE NUMBER	FEET OF CORE IN BOX (interval)	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
00 ↓	00 to 13		0.9 (1)	CL			Clay >50%	1		Silty clay Grayish brown (5yr 3/2) Medium plasticity Some sand and roots Trace gravel
	13 to 20		0					2		No Sample
	20 to 40		2.0 (1) N.D.	CL			Gravel 40% Clay 50%	3		Top 17 ft of interval ~~SAA with~~ Same as above with increasing gravel content toward bottom of interval with color grading to olive gray (5Y 4/1) max gravel size is 6cm. Bottom portion of interval is a silty clay moderate yellowish brown (10YR 5/4) moderately high plasticity, trace of calcarious mineralization, sand, & carbonaceous material
Box 1 of 2	4.0 to 7.0		N.D. (2)				Clay >50%	4, 5, 6		Silty Claystone moderate yellowish brown (10YR 5/4) massive bedding highly weathered, moderately friable trace of calcarious mineralization, roots, & carbonaceous material ~~Sam~~ increased iron staining thru out matrix with depth.
↑ 9.5	7.0 to 9.5		N.D. (2)				Clay >50%	7, 8, 9		Same as above with silt & V. fine sand lenses increase amount of iron staining, fractures evident w/ iron staining w/ in. Trace of siderite nodules.
9.5										

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 41-87 Br

DATES DRILLED
ELEVATION
GEOLOGIST(S) TSD/LAA
DATE
CHECKED BY.
DATE. 7/24/89

USCS symbol

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INCHES)	SAMPLE NUMBER	FEET OF CORE IN BOX (INCHES)	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 2 ↑ 17.0	9.5 TO 11.9		2.3 (2)					Clay >50%	11		Silty claystone light olive gray (5Y 6/1) massive bedding, highly weathered, moderately friable some iron staining in fractures & matrix trace of very fine sand & carbonaceous material, includes a ~~light brown~~ siltstone nodule dark yellowish orange (10YR 6/6).
	12.0 TO 12.2		ND (1)						12		NO SAMPLE. SAME AS ABOVE moderate yellowish brown (10YR 5/4)
	12.2 TO 14.5		ND (2)					Clay >50%	13, 14		Claystone light brownish gray (5YR 6/1) massive bedding, slightly weathered, ~~slightly~~ moderately friable trace of iron staining & vertical fractures.
	14.5 TO 17.0		ND (2)					Clay >50%	15, 16		Silty claystone light brownish gray (5YR 6/1) bedding in not evident, higly weathered, highly friable, some iron staining.
									17, 18, 19		Bottom of boxes

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

βγ - Box 2 = 100 TO 150 cpm

LOG OF BORING NO. 41-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DAT
DATE:
CHECKED BY:

USCS symbol

DATE: 8/8/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN BOX (IN FEET)	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
~~18.5~~ ↓ TOP OF BOXES									11, 12, 13, 14, 15, 16, 17, 18	← ERASER DAT	
18.5 ↓	18.5 -19.1		ND						19		CLAY, LIGHT OLIVE GREY (5Y 4/1), MOD-HIGH PLASTICITY SOME SILT, TRACE OF IRON STAINING
BOX 1 OF 10			Ø								NO SAMPLE

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 41-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DAT
DATE:
CHECKED BY:
DATE: 8/8/89

PROJECT NO: 667-11.22

											LITHOLOGIC DESCRIPTION
			Ø						21		NO SAMPLE
	21.5 -22.5		ND (1)						22		CLAY, LIGHT OLIVE GREY (5 Y 4/1), MOD-HIGH PLAST, SOME SILT, SOME IRON STAINING
	~~23.9 -24.5~~ 22.5 23.9		(1) 1.65						23		SAME AS ABOVE; TRACE WHITE-OPAQUE MINERALIZATION
	23.9 -24.5		ND						24		SAME AS ABOVE, NO MINERALIZATION APPARENT
	24.5 -25.0		Ø						25		NO SAMPLE
BOX 1 OF 10	25.0 -25.65		(1) .75								SAME AS ABOVE, IRON STAINING IN FRACTURES AND AS MOTTLE
	25.65 -27.15		ND						26 27		TOP 6-8 IN OF INTERVAL CARBONACEOUS SILTY CLAY, OLIVE BLACK (5 Y 2/1), MOD PLAST., SOME IRON STAINING IN FRACTURES & AS MOTTLES ~~GRADES INTO BOTTOM~~ BOTTOM OF INTERVAL, CARBONACEOUS SILTY CLAYSTONE OLIVE BLACK (5 Y 2/1), MASSIVE BEDDING, GRADATIONAL CONTACT, MOD FRIABLE, WELL WEATHERED, SOME IRON STAINING IN FRACTURE ~~AND AS MOTTLES, COAL SEAMS < 2 MM~~
	27.15 -28.5		Ø						28		NO SAMPLE
	28.5 -29.2		ND						29		SILTY CLAYSTONE, LIGHT OLIVE GREY (5 Y 6/1), MASSIVE BEDDING, WELL WEATHERED MOD FRIABLE, ~~TRACE OF~~ SOME CARB MATERIAL, TRACE OF IRON STAINING
	29.2 -30.1		(2) 1.0								SAME AS ABOVE; TRACE CARB MATERIAL, NO IRON STAINING, V SLIGHTLY CALCAREOUS

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 41-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): JAY
DATE:
CHECKED BY:

USCS 4 Y 1001

DATE: 8/8/89

PROJECT NO: 667-11.22

Depth in Feet	Depth in Core	Sample Number	Feet of Core	Feet of Core	Fractures per Foot	Fracture Angle	Bedding Angle	Drilling Size	Depth in Feet	Lithologic Log	Lithologic Description
30.1 ↓	30.1-31.9		ND						31		SILTY CLAYSTONE, OLIVE GREY (5 Y 4/1) MASSIVE BEDDING, HIGHLY WEATHERED, MOD FRIABLE, TRACE OF CARB MATERIAL TRACE OF IRON STAINING AS MOTTLE IN UPPER PART OF INTERVAL
Box 2 of 10	31.9-34.5		(2) 1.75						32, 33, 34		SAME AS ABOVE, LIGHT OLIVE GREY (5 Y 6/1), INCREASING AMOUNT OF CARB ESPECIALLY AT BOTTOM OF INTERVAL, TRACE OF IRON STAINING
	34.5-35.0		ND								SAME AS ABOVE, ~~LESS~~ TRACE OF CARB
	35.0-36.3		(2) 1.2						35, 36		SAME AS ABOVE;
	36.3-38.5		(2) 1.85						37, 38		SAME AS ABOVE; ABUNDANT CARB MATERIAL ~~IN BOTTOM OF SECTION INTERVAL~~ BOTTOM OF INTERVAL, BROWNISH GREY (5 YR 4/1), WITH <1 MM COAL SEAMS
	38.5-40.2		ND						39		SAME AS ABOVE, LIGHT OLIVE GREY (5 Y 6/1), TRACE OF CARB MATERIAL, SLIGHTLY CALC.

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 41-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): WAY
DATE:
CHECKED BY: DATE: 8/8/89

PROJECT NO: 667-11.22

Elevation	Depth	Sample No.	Type	Recovery (%)	RQD	Blows/6"	Water Level	Penetration Resistance	Depth	Graphic Log	Lithologic Description
40.7											SEE PREVIOUS PAGE
	40.7 -42.0			ND ~~18~~					41		SILTY CLAYSTONE, LIGHT OLIVE GREY (5 Y 6/1), MASSIVE BEDDING, WELL WEATHERED, MOD FRIABLE, TRACE OF CARB MATERIAL
	42.0 -42.8			(2) 1.1					42		SAME AS ABOVE, SOME CARB MATERIAL, TRACE IRON STAINING, <1-2 MM COAL SEAMS, TRACE OF IRON STAINING, TRACE OF WHITE, NON-CALC MINERALIZATION
	42.8-43.0			Ø					43		NO SAMPLE
	43.0 -43.7			ND							SAME AS ABOVE, TRACE CARB MATERIAL, NO COAL SEAMS
	43.7 -44.8			ND					44		CLAYEY SILTSTONE, LIGHT OLIVE GREY (5 Y 6/1) HORIZONTAL BEDDING W/ SOFT SED DEFORMATION (FROM SLAB), MOD-POORLY FRIABLE, MOD WEATHERED, SOME CARB MATERIAL, TRACE OF COAL SEAM < 1 mm
	44.8 -47.5			Ø					45 46 47		NO SAMPLE
	47.5 -48.1			ND					48		SAME AS ABOVE; W/ CLAY INTERBEDS
	48.1 -49.4			(2) 1.1					49		SAME AS ABOVE
				Ø							NO SAMPLE

Box 3 of 10

ERASER-WAY

ERASER-WAY

NOTES: General: The USCS is modified for this log as follows: material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 41-87, BE

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): D AT
DATE:
CHECKED BY:
USCS Symbol
DATE: 8/3/87
PROJECT NO: 667-11.22

Depth Interval	Sample Number	Sample Type	Recovery (%)	RQD (%)	Fracture Frequency	Fracture Type	Fracture Angle	Drilling Rate (min/ft)	Elevation (ft)	USCS Symbol	LITHOLOGIC DESCRIPTION
Box 3 of 10											NO SAMPLE
	505-512		ND						51		SILTY CLAYSTONE, LIGHT OLIVE GREY (5 Y 6/1) MASSIVE BEDDING, WELL WEATHERED, MOD FRIABLE, SOME CARB, TRACE OF IRON STAINING AS MOTTLES
	512-530		ND						52		TOP 1 FT, SAME AS ABOVE. BOTTOM OF INTERVAL, CLAYSTONE, LIGHT OLIVE GREY (5 Y 6/1), MASSIVE BEDDING, WELL WEATHERED, MOD FRIABLE, TRACE OF CARB MATERIAL, TRACE OF IRON STAINING AS MOTTLES
530 ↓	530-547		ND						53, 54		SAME AS ABOVE, NO CARB MATERIAL, NO IRON STAINING
	547-552		165 (1)		ERASER WAS				55		SAME AS ABOVE, TRACE CARB MATERIAL TRACE IRON STAINING AS MOTTLES AND ALONG FRACTURES
Box 4 of 10	552-570		Ø						56, 57		NO SAMPLE
	570-590		(2) 1.7						58		SAME AS ABOVE, BOTOM OF INTERVAL IS OLIVE GREY (5 Y 4/1), SOME SILT
	590-605		ND						59		SILTY CLAYSTONE, OLIVE GREY (5 Y 4/1), TO LIGHT OLIVE GREY (5 Y 6/1) MASSIVE BEDDING, MOD WEATHERED, MOD FRIABLE, SOME CARB MATERIAL, TRACE IRON STAINING, TRACE WHITE MINERALIZATION

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 41-87-BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DAT
DATE:
CHECKED BY:
USCS SYMBOL
DATE: 8/8/89
PROJECT NO: 667-11.22

Box	Depth	Recovery	Core Run	RQD	Fracture Freq	Fracture Type	Weathering	Moisture	Elevation	Lithologic Description
										SEE PREVIOUS PAGE
Box 4 of 10	6055-609		ND							SILTY CLAYSTONE, LIGHT OLIVE GREY (5Y 4/1), MASSIVE BEDDING, MOD WEATHERED, MOD-LOW FRIABILITY, TRACE CARB MATERIAL, TRACE IRON STAIN
	609-610		∅						61	NO SAMPLE
	610-623		ND							SAME AS ABOVE, OLIVE GREY (5Y 4/1), DECR AMOUNTS OF SILT
623 ↑									62	
623 ↓	623-630		(1) .85							CLAYSTONE, OLIVE GREY (5Y 4/1), MASSIVE BEDDING, HIGHLY WEATHERED, MOD FRIABLE, TRACE CARB MATERIAL, ~70° FRACTURE
	630-636		ND						63	SAME AS ABOVE, TRACE OF SILT
	636-647		ND						64	SAME AS ABOVE, OLIVE BLACK (5Y 2/1), SOME SILT
	647-652		(1) .07						65	SILTY CLAYSTONE, OLIVE GREY (5Y 4/1), MASSIVE BEDDING, HIGHLY WEATHERED, MOD FRIABLE, SOME CARB MATERIAL
Box 5 of 10	652-670		ND						66	SAME AS ABOVE, SILT CONTENT ~~IS HAS INCREASED~~ IS LARGER AT VERY BOTTOM OF INTERVAL, THERE IS A SHARP CONTACT WITH UNDERLYING ROCK
	670-6885	DAT #1	ND						67	BOTTOM 4 IN OF 652-670 VFG-FG SANDSTONE, LIGHT GREY (N7), LAMINAR BEDDING W/ POSSIBLE SOFT SED DEFORMATION, HIGHLY WEATHERED, MOD FRIABLE, ANGULAR-SUBROUNDED, MOD SORTED, SOME CLAY, SOME CARB. MATERIAL
									68	670-6885 SAME AS ABOVE
	6885-7045		ND						69	SAME AS ABOVE, TRACE OF CLAY STRINGER, BOTTOM OF INTERVAL ~~BECOMES~~ HAS GREATER AMT OF CLAY

NOTES: General: The USCS is modified for this log as follows: material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core wedges cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 41-87 BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): Ady
DATE:
CHECKED BY: DATE: 8/10/89

PROJECT NO: 667-11.22

Depth Scale	Depth Drilled	Core Run	Recovery	USCS Symbol	Fracture Freq	Fracture Type	Water Level	Drilling Stress	Elevation	Graphic Log	LITHOLOGIC DESCRIPTION
TOAS											SEE PREVIOUS PAGE
70.45	70.45 -71.0		GASES ND								SILTY CLAYSTONE, LIGHT OLIVE GREY (5 Y 6/1), HIGHLY WEATHERED, MOD-POORLY FRIABLE, SOME CARB MATERIAL, IRON STAINING AS MOTTLES
	71.0 - 75.0		(2) 2.3						71 72 73 74		SAME AS ABOVE, SOME OLIVE GREY (5 Y 4/1), TRACE OF IRON STAINING AS MOTTLES IN TOP OF INTERVAL
	75.0- 75.5		ND		65-80°				75		SAME AS ABOVE, CURVING FRACTURE AT 65°-80°, MOD FRIABLE
	75.5 -77.3		ND		50°				76 77		SAME AS ABOVE, FRACTURE AT 50°, MIDDLE ~~BOTTOM~~ OF INTERVAL LIGHT OLIVE GREY (5 Y 6/1), BECOMING SILTIER, ~~BO~~ BOTTOM OF INTERVAL, OLIVE GREY (5 Y 4/1), LESS SILTY
	77.3 -79.0		(2) 1.1						78		SAME AS ABOVE, BOTTOM OF INTERVAL: LIGHT OLIVE GREY (5 Y 6/1), BECOMING SILTIER
	79.0- 79.6		ND						79		SAME AS ABOVE
	79.6 -81.2		ND								VFG-FG SANDY SILTSTONE, LIGHT OLIVE GREY (5 Y 6/1 HORIZONTAL LAMINAE, GRADATIONAL CONTACT, HIGHLY

BOX 6 OF 10

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core wedges cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 41-87-B12

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DAT
DATE:
CHECKED BY:
USCS symbol
DATE: 8/10/89

PROJECT NO: 667-11.22

Box	Depth	Sample	Core	PID (ppm)	Blows	Recovery	Water	Lithologic Symbol	Elevation	Graphic Log	LITHOLOGIC DESCRIPTION
Box 6 of 10											WEATHERED MOD-LOW FRIABILITY, SOME CLAY, IN MATRIX AND AS LENSES, TRACE OF CARB MATERIAL, SLABBED SHOWS. SOFT-SED DEFORMATION
81.2									81		
81.2	81.2 -82.0		ND								SAME AS ABOVE
	82.0 -82.85		ND					20% SILT 50% VFG 30% FG	82		SILTY VFG-FG SANDSTONE, YELLOWISH-GREY (5 Y 8/1), LAMINER BEDDING W/ POSSIBLE SOFT SED DEFORMATION, HIGHLY WEATHERED, MOD-LOW FRIABILITY, SUBANGULAR-SUBROUNDED, MOD SORTED, SOME CLAY AS LENSES, TRACE CARB MATERIAL
	82.85 -84.5		(2) 1.1					20% SILT 50% VFG 30% FG	83		SAME AS ABOVE
									84		
Box 7 of 10	84.5 -86.0	DAT #2	(2) 1.8					20% SILT 30% MG 50% FG	85		SAME AS ABOVE, FG-MG
	86.0 -87.9		ND					20% SILT 30% VFG 30% FG	86		SAME AS ABOVE, VFG-FG
									87		
	87.9 -89.6	DAT	ND						88		SAME AS ABOVE, INCREASED LENSES OF SILT AND CLAY
89.6									89		
89.6 Box 8 of 10	89.6 -90.0		ND								SAME AS ABOVE

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 41-87-BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DAT
DATE:
CHECKED BY:
DATE: 8/10/89

PROJECT NO: 667-11.22

Depth Drilled	Depth Sampled	Type	Recovery (%)	USCS Symbol	Fracture Freq	Fracture Type	Weathering	Blow Counts	Depth in Feet	Sketch	LITHOLOGIC DESCRIPTION
Box 8 of 10	80.0 -91.15		ND						91		SILTY, VFG-FG SANDSTONE, YELLOWISH-GREY (5 Y 8/1), LAMINAR BEDDING W/ POSSIBLE SOFT SED DEFORMATION, HIGHLY WEATHERED, MOD-LOW FRIABILITY, SUBANGULAR-SUBROUNDED, MOD SORTED, TRACE OF CARB. MATERIAL, LENSES OF MED MG SAND, SOME CLAY
	91.15 -92.85		ND					20% SILT 15% MG 50% FG 25% VFG	92		SAME AS ABOVE; BOTTOM OF INTERVAL BECOMES FG-MG, LESS SILT, INCR AMOUNT OF CARB. MATERIAL, IRON STAINING
	92.85 -93.6		(2) .6				?	20% SILT 15% MG 50% FG 25% VFG	93		SAME AS ABOVE
	93.6 -94.45		(2) .7						94		CLAYEY SILTSTONE, LIGHT OLIVE GREY, LAMINAR BEDDING, HIGHLY WEATHERED, MOD TO LOW FRIABILITY, SOME CARB MATERIAL, TRACE OF IRON STAINING, TRACE OF GREENISH YELLOW GREEN (5 GY 7/2) CLAY
	94.45 -96.2		ND						95		SAME AS ABOVE, BEDDING NON-APPARENT
	96.2 -98.0		ND						96 97		TOP 1 FT. SILTY VFG-FG SANDSTONE, YELLOWISH GREY (5 Y 8/1), THIN HORIZONTAL LAMINAR BEDDING W/ POSSIBLE SOFT SED DEFORMATION, MOD-HIGHLY WEATHERED, MOD-LOW FRIABILITY, SUB-ANGULAR-SUBROUNDED, MOD SORTING, SOME CLAY, SOME CARB MATERIAL. BOTTOM 6 IN SILTSTONE, LIGHT OLIVE GREY (5 Y 8/1), MOD-HIGHLY WEATHERED, MOD-LOW FRIABILITY, TRACE CARB MATERIAL, TRACE IRON STAINING
98.0 ↑ 98.0 ↓ Box 9 of 10	98.0 -99.7		ND						98 99		VFG-FG SANDSTONE, YELLOWISH GREY (5 Y 8/1), THINLY LAMINATED INTERBEDDED W/ CARB MATERIAL, MOD-HIGHLY WEATHERED, MOD-LOW FRIABILITY, MOD SORTING, SOME SILT. SLAB SHOWS BEDDING & INTERFINGERING W/ LIGHT OLIVE GREY (5 Y 6/1) SILTSTONE
	99.7 -101.0		ND								SILTSTONE, OLIVE GREY (5 Y 4/1), MOD-HIGHLY WEATHERED, MOD-LOW FRIABILITY, VFG-FG

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 41-87-BR

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DAT
DATE:
CHECKED BY: DATE: 8/10/89

PROJECT NO: 667-11.22

Depth	Sample No.	Blows/6 inches	Recovery	Field Test	Lab Test	Lab Test	Lab Test	Lab Test	Lab Test	Elev.	Graphic	Lithologic Description
												INTERBEDDED SANDSTONE, ~~SOME~~ TRACE OF CLAY
	101.0-102			ND						101		VFG-FG SANDSTONE, YELLOWISH-GREY (5 Y 8/1) BEDDING NON APPARENT, MOD-HIGHLY WEATHERED MOD-LOW FRIABILITY, MOD SORTING, ~ 10% SILT
	102-103			ND						102		SILTSTONE, LIGHT OLIVE GREY (5 Y 6/1) MOD-HIGHLY WEATHERED, MOD-LOW FRIABILITY INTERBEDDED W/ VFG-FG SANDSTONE (~1-5 m) YELLOWISH GREY (5 Y 8/1), TRACE CARB. MATERIAL, TRACE IRON STAINING AS MOTTLES
Box 9 of 10	103-104.8			ND						103		SAME AS ABOVE
										104		
	104.8-106.0			ND						105		SAME AS ABOVE
106.0										106		TOP 1.5 ft SAME AS ABOVE
106.0	106.0-110.0			(2)						107	BRASSE MOD	
Box 10 of 10				4.8						108		SILTY CLAYSTONE, OLIVE GREY (5 Y 4/1), MASSIVE BEDDING, HIGHLY-MOD WEATHERED MOD-LOW FRIABILITY, TRACE CARB MATERIAL, MULTIPLE FRACTURES AT ≈50° IN 1 DIRECTION, 20° IN OTHER DIRECTION
										109		BOTTOM 1.5 ft - SAME AS ABOVE, NO DISTINCT FRACTURES
109												

END OF BOXES

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 41-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): UAA
DATE:
CHECKED BY:
DATE: 7/26/89
PROJECT NO: 667-11.22

USCS symbol

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (in feet)	SAMPLE NUMBER	FEET OF CORE (in feet)	~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	00 ↓ to ↑ 20		1.2(1)	GW				Gravel >50%	1		Gravel. Predominantly med light gray to Med. dark gray (N6 to N4) Angular to sub rounded well graded Max size 7.5cm Some silty clay Some sand fine to coarse grained. Some surface grass + roots, some calcareous ~~con~~ mineralization
	20 ↓ to ↑ 40		1.3(1)	GW				"	2, 3		Gravel Predominantly med dark gray (N4) Sub angular to sub rounded Well graded Max size - 5.5 cm Sand clay and silt present. Abundant. $CaCO_3$.
	40 ↓ ↑ 7.0		1.2(1)	GW				"	4, 5, 6		Same as above
	7.0 ↓ ↑ 9.5		0.5(1)	GW				"	7, 8, 9		Same as above No $CaCO_3$ (No reaction with HCl)
	9.5 ↓										

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

BO Box 1 50-100cpm

LOG OF BORING NO. BH 41-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY: DATE: 7/26/89

USCS symbol

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (IN BOX)	SAMPLE NUMBER	FEET OF CORE IN BOX	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 2	9.5 ↓ to ↑ 12.0		0.7 (1)	CL			Clay 750%	11, 12		Gravelly sandy clay Dark yellowish orange (10R 6/6) Moderate plasticity Some silt Gravel subangular to subrounded, to 4.5cm well graded. Some CACO3 (moderate HCL reaction.)
	12.0 to 14.5		1.9 (1)	GW			Gravel 750%	12, 13, 14		~~No Sample~~* Gravel Mainly med dark gray (N4). Subangular to subrounded Well graded Max size 70cm. Sand, clay + silt present Some caCO3
	14.5 ↓ to ↑ 17.0	SL	1.9 (1)	CL				15, 16, 17		Top 0.5 ft. Same as above grading to Claystone Yellowish gray (5Y 7/2). Moderately high plasticity Massive(?) bedding. Weathered Slightly friable. Trace silt. Some iron staining throughout matrix No HCl reaction
New Box ↓ 17.0 Box 2 of 2 19.5	17.0 ↓ to ↑ 19.5		2.7 (2)	CL				17, 18, 19		Same as above New Box ↓
										Bottom of Boxes

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

* Marker blocks were out of order This is what is believed to be correct but may not actually be the correct interval.

LOG OF BORING NO. BH 41-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:

USCS SYMBOL

DATE: 7/28/89

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0ft		1.1(1)	GC				Gravel 70% Clay 30%	1		Gravel Predominantly dark gray (N3) Angular to subrounded. Moderately well ~~sorted~~ graded Max size 4.5cm. Silty clay matrix. moderate brown (5yr 3/4) moderate plasticity some sand
	2.0								2		
	2.0		0.9(1)	GC				Gravel 80% Clay 20%	3		Gravel. Same as above Max size - 7cm. Some CaCO3 rinds on gravel
	4.0								4		
	4.0		2.9(1)	GC				Gravel 50% Clay 50%	5		Gravel. Same as above more clay matrix material matrix color change to light brown, (5yr 5/6). Sandy. CaCO3 still present
7.0	7.0								7		
									8		Bottom of Box
									9		the rest of this box had VOA sample bottles.

Box 1 of 1

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

BO Box: 50 to 150 cpm.

LOG OF BORING NO. 42-87

GEOLOGIST(S): DCB
DATE: 7/20/89

PROJECT NO: 667-1623

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 TO 0.5	(1) 0.5				50% clay 50% gravel	CL GP			Clay, dark yellowish brown (10 YR 4/2), moderate plasticity, some silt and organic detritus. At 0.3 ft interval grades to gravel, medium gray (N5), subangular, poorly graded
	0.5 to 2.0	0						1, 2		No Sample
	2.0 to 2.9	(1) 0.75				>50% gravel	GP	3		Clayey Gravel, light gray (N7), angular to subangular, poorly graded, some sand and silt
	2.9 to 4.0	0						4		No sample
	4.0 to 6.1	(1) 2.2				>50% clay	CL	5		Gravely, silty clay, mottled, light olive gray (5 Y 6/1), dark yellowish orange (10 YR 6/6), moderate plasticity some fine sand.
	6.1 to 6.9	(1) 0.65					CL	6		Siltstone, grayish orange (10 YR 7/4) bedding not discernable (massive?) highly weathered, moderately friable localized inclusions of white carbonate mineralization 2mm and less in size.
	6.9 to 7.4	0						7		NO SAMPLE
	7.4 to 9.9	2.5						8, 9		Claystone, light gray (N7), mottled grayish orange (10 YR 7/4), bedding not discernable, (massive?), highly weathered, moderately friable, localized inclusions of white carbonate mineralization 2mm and less in size.

see next page

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

This log has been re-copied to include correct graphic lithologic log. CKF

ROCKY FLATS PLANT

FIGURE NO.

B γ Background 50-150 cpm
Box 1 50-200 cpm

LOG OF BORING NO. 42-87

GEOLOGIST(S): DCB
DATE: 7/20/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 1 ↑ 12.0	9.9 to 12.0	1.85						11		As above with gradational change to siltstone with depth. Iron oxide staining occurs on fractures. Fractures are curvilinear
Box 2 of 2 ↑ 12.4	12.0 TO 12.4	0.4						12		As above
								13		

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 42-87

~~DATES DRILLED~~
~~ELEVATION~~
GEOLOGIST(S) OCB
DATE 7/20/89
CHECKED BY DATE

PROJECT NO 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	USCS SYMBOL ~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0	0.0 to .5		.5 (1)	CL GP			50% Clay 50% Gravel			Clay, dark yellowish brown (10 YR 4/2), moderate plasticity, some silt and organic detritus At .3 ft. stratal gradation Gravel, medium gray (N 5), subangular, poorly graded
	.5 to 2.0		0					1		No sample
	2.0 to 2.9		(1) .75	GP			>50% gravel	2		Clayey Gravel, light gray (N7), angular to subangular, poorly graded, some sand and silt
	2.9 to 4.0		0					3		No Sample.
Box 1 of 1	4.0 to 6.1		(1) 2.2	CL			>50% Clay	4 5		Gravelly, silty Clay, mottled light olive gray (5 Y 6/1), dark yellowish orange (10 YR 6/6), moderate plasticity, some fine sand.
	6.1 to 6.9		(1) .65	OCB CL				6		Siltstone, grayish orange (10 YR 7/4), bedding not discernable (massive?), highly weathered, moderately friable, localized inclusions of white carbonate mineralization 2mm and less in size
	6.9 to 7.4		0					7		Claystone, light gray (N7), mottled grayish orange (10 YR 7/4), bedding not discernable (massive?), highly weathered, moderately friable, localized inclusions of white carbonate mineralization 2mm and less in size
	7.4 to 9.9		2.5					8 9		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

see next page

ROCKY FLATS PLANT

FIGURE NO.

Box 8 Background 50-150 cpm
Box 1 50-200 cpm

LOG OF BORING NO. 42-87

~~DATES DRILLED~~
~~ELEVATION~~
GEOLOGIST(S) DCB
DATE 7/20/89
CHECKED BY DATE

USCS symbol

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (interval)	SAMPLE NUMBER	FEET OF CORE IN BOX (interval)	~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 1 ↑ 12	9.9 to 12.0		1.85					11		As above with a gradational change to siltstone with depth. Iron oxide staining occurs on fractures. Fractures are curvilinear
12 Box 2 of 2 12.4	12 to 12.4		.4					12		As Above
								13		
								14		
								15		
								16		
								17		
								18		
								19		

NOTES. General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

38

LOG OF BORING NO. BH 42-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): CAA
DATE:
CHECKED BY: DATE: 8/4/89

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN FEET	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE RECOVERED	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0 0	0.0 to 2.0		75(1)	GC			GC CA	Gravel >60%	1		Silty gravel Matrix (5yr 3/2) mod brown Gravel angular to subrounded. Poor to mod graded Max size 5cm Floury matrix is calcite Trace Sand Some calcite clasts — avg 3cm
	2.0 to 4.0		.6(1)	GC			GC CA	Gravel >60%	2, 3		Gravel White (N9) matrix Gravel subangular to subrounded Poor to mod grading Max size 6cm Calcite + ~~clay~~ silty clay matrix Floury Calcite rinds on gravel Interval Extremely Calcitic
	4.0 to 7.0		1.9(1)	GC			GC CA	Gravel ≈50% Calcite ≈25% Clay ≈25% Sand + clay >50%	4, 5, 6		Gravel in Calcite + sandy clay matrix Gravel angular to Subangular Poorly graded Max size, 5cm matrix mod yellowish brown (10yr 5/4) Grading to Gravelly sand and clay Slightly less calcitic
	7.0 to 9.5		.4(1)	GC			GC CA	Clay ≥30 Sand ≥30 Gravel ≥30	7, 8, 9		Clayey sand and gravel Grayish orange (10yr 7/4) Gravel mod graded Angular to Sub. rounded Max size 3cm Sand well graded Coarse to very fine Slightly calcitic
	9.5										See next pg

Box 1 of 6

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 42-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY: DATE: 8/4/89

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE RECOVERED	USCS & SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION	
	9.5 to 12.0		.75	GC				Clay ≥30% Gravel ≥30% Sand ≥30%	11 12		Clayey Sand + gravel as above	
	12.0 to 14.5		.7	GC				Gravel ≥50% >70%	13 14		Sandy clayey gravel. Matrix lt brown (5yr 5/6) to Mod yellowish brown (10yr 5/4). Angular to subangular Mod well graded Max size 5.5cm matrix sandy clay Sand fine to coarse	
15.5	14.5 to 15.6		.8	GC				Gravel >70%	15		Same as above	
15.5 to Box 2 of 6	15.5 to 19.5		.8 (1)	GC				Gravel ≈50% Clay ≈50%	16 17 18 19		Clayey sandy gravel Matrix grayish orange (10yr 7/4) Gravel sub angular to subrounded Poor to mod sorting Max size 6cm Sandy clay matrix est. plast mod to high sand fine to med gravel Some very highly iron stained areas	Begin New Box

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 42-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:

USCS symbol

DATE: 8/4/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	~~FEET OF CORE IN BOX~~	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 6	19.5 to 22.0		~~2.5~~ 2.15 (1)	CL				Clay >70% Sand ≈10%	21		Sandy, ~~gravelly~~ Clay yellowish gray (5y 8/1), to grayish orange (10yr 7/4) Est mod to high plast sand med grained Some Gravel, angular to sub rounded 2.5cm -5.5cm
	22.0 to 24.0		2.5 (1)	GW					22, 23, 24		Gravel Angular to subangular mod well graded. Max size: 5.5cm
↓↑ 24.5	24.0			ML				Silt ≈100%			Silt Pinkish gray (5yr 8/1) to grayish orange. (10yr 7/4) Bedding not apparent
Box 4 of 6	24.0 to 27.0		2.7 (1)	ML				Sand ≈30% Silt ≈50%	25, 26		~~Very f grained silty sandstone~~ ~~Silt~~ Very lt gray to grayish orange (N8) to (10yr 7/4). ~~Clean silt~~ Horizontal bedding Highly weathered mod. friable very f grained well sorted, Some small caliche pocket toward bottom
	27.0 to 29.5		3.0 (1)					Sand ≈50% Silt ≈50%	27, 28, 29		Same as above. Slightly darker color to dk. yellowish orange Some surfaces have calcitic mineralization
	29.5										

~~24~~ Begin Box 3

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

Box 3 of 6 ~~const~~ contained only Field Screen Jars.

LOG OF BORING NO. BH 42-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:
DATE: 8/4/89
PROJECT NO: 667-11.22

USCS symbol

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN BOX (IN FEET)	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 4 of 6 → 32.0	29.5 to 32.0		2.9 (1)					Sand 50% Silt 50%	31		Very fine grained silty sandstone lt gray to grayish orange (N8 to 10yr 7/4), to dark yellowish brown (10yr 4/2) Well graded Evidence of cross bedding
32.0 ↓	32.0 to 34.5		1.1 (1)					Sand ≥50% Silt ≤50%	32, 33, 34		Silty sand-sandstone Very pale orange to dark yellowish orange (10yr 8/2 to 10yr 7/4) Bedding not apparant If stone, highly weathered, highly friable Well sorted in areas, poorly sorted in others Grains med sized mainly rounded grains trace coarse
Box 5 of 6	34.5 to 37.0		.5 (1)					Sand ≤50% Silt ≥50%	35, 36		Same as above Generally more well sorted generally: med grained
	37.0 to 39.0	LAA #1 Grain Size	1.9 (1)					50% Sand 50% silt	37, 38		Silty sand (stone?) Very pale orange to pale yellowish orange (10yr 8/2 to 8/6) Mod well graded, rounded grains very fine to med grained Trace coarse If stone, very weathered, very friable
	39.0 to								39		No Sample - Markers in boxes seem to indicate 39.0 - 48.5 used for samples

Begin Box

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 42-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:
DATE: 8/4/89

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
									41		No Sample - 39.0-48.5 appear to have been taken for samples
									42		
									43		
									44		
									45		
									46		
									47		
									48		
	48.5										
	48.5 to 51.0		.6(1)					Sand ≈50% Silt ≈50%	49	S S S S S S	Silty Sand (Stone 7) Very pale orange to pale yellowish orange (10yr 8/2 to 8/6) Mod graded Rounded grains very fine to med., Trace coarse If stone, highly weathered, highly friable. Some evidence of horizontal bedding.

Box 5 of 6

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 42-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:
DATE: 8/4/89

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN BOX (IN FEET)	SAMPLE NUMBER	FEET OF CORE (IN INCHES)	FEET OF CORE IN BOX	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
											See description on previous page.
51.0	51.0										
51.0	51.0								51		Silty sandstone. Yellowish gray (5y 8/1). As above. Begin New Box
↓									.3		Clay. Light brownish gray. Sharp contact. Horizontal bed. Some carb. material getting silty
								Sand ≈50%	.3		Silty Sandstone yellowish gray (5y 8/1) to grayish orange (10yr 7/4). Wavy bedding very thin clay layers (≈1 mm)
	↑		17 (1)						52		
	52.5							Clay 90%	1.0		Claystone Lt. brownish gray (5yr 6/1) Sharp contact bedding not evident.
	52.5							Clay >80%			Claystone, same as above
Box 6 of 6									53		
									1.0		
	↑		235 (1)					Sand ≈50% Silt ≈50%	54		Silty Sandstone Grayish orange (10yr 7/4.) Bedding not apparant but probable horizontal. Highly weathered Mod. Friable Fine to med. grained Mod sorted. Rounded grains. Some gravel ≈.75 cm clay layer (as above ≈.75 in)
									55		Trace clay in silty sandstone
55.5	55.5										
									56		Bottom of Boxes
									57		
									58		
									59		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 43-87BH

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:
DATE: 7/31/89

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (FEET/CM)	SAMPLE NUMBER	FEET OF CORE IN BOX (FEET/CM)	USCS SYMBOL ~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0 0	0.0 to 2.0		1(1)	CL				Clay 70% Gravel 30%	1		Gravelly clay Dark yellowish brown. (10yr (4/2) Mod to high plasticity slightly silty ~~Some~~ LA Trace Sand Gravel Subangular to subrounded Mod well graded Max. size. 4 5cm Some grass + surficial root material.
	2.0 to 4.0		.7(2)	CL				Clay 90%	2, 3		~~Same as above Less gravel~~ LA Clay. Dark yellowish brown (10yr 4/2) Moderate to high plasticity Slightly silty. Some sand Trace gravel, Surficial root material Slightly Calcitic.
Box 1 of 2	4.0 to 6.0		.5(2)	CL				Clay 65% Silt 30% Other 5%	4, 5		Silty Clay Predominantly pale yellowish brown. (10yr 6/2). Moderate plasticity Some sand. Trace gravel Trace calcite
	6.0 to 8.0		1.3(1)	GC				Gravel >50% Clay ≥60% ~~>50%~~ LA	6, 7, 8		Top .5 ft of interval. Clayey Gravel Med Dark gray (predominantly). Sub angular to Sub rounded well graded Max size. 4 5 cm. Matrix: Sandy Clay. Light brown (5yr 5/6). Last .8 ft of interval Silty clay Pale yellowish brown (10yr 6/2) Mod Plasticity Some Sand Some sand. Some gravel (2 5-3.0cm.)
	8.0 to 10.0		.5(1)					Clay >50%	9		Same as above. Large pieces of gravel (to 6 cm)

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 43-87BH

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:
USCS symbol
DATE: 7/31/89
PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE / FEET OF RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION	
Box 1 of 2	10.0		0					11		No Sample	
	12.0	~~12.0~~					Clay 70%	12		Silty Clay yellowish gray (5Y 7/2). moderately high plasticity	
	to		.7(1)	CL			Silt 30%	13			
14.0	14.0							14			
Box 2 of 2	14.0						Clay >80%			~~Silty Clay~~ Clay yellowish gray (5Y 8/1) mod to high plast Trace silt	Begin Box 2
	to		(1) .3	CL				15			
	16.0							16			
	16.0						Clay 80% Silt 20%			Clay. Brownish gray (5yr 4/1) ~~Mod to~~ High plasticity Trace silt	
	to	SL	(1) 8	CL				17			
	18.0							18			
	18.0						Clay >80%			Clay, Same as above also some dark yellowish orange coloring (10yr 6/6.)	
	to		(1) .6	CL				19			
	20.0										

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 43-87 BH

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:
DATE: 8/1/89
PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE (% INDICATES RECOVERY)	USCS SYMBOL (FEET OF CORE IN RUN)	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 2	20.0 to 22.0		(1) .7	CL				Clay >80%	21		Clay Brownish gray to dark yellowish orange (5yr 4/1 to 10yr 6/6) Trace silt
	22.0 to 24.0		(1) .7	CL				Clay >80%	22, 23		Same as above
	24.0 to 26.0		(1) .4	CL				Clay >80%	24, 25		Same as above
	26.0 to 28.0		(1) .7	CL				Clay >80%	26, 27		Same as above
	28.0 to 30.0		(1) .7	CL				Clay >80%	28, 29		Same as above Some iron staining in hairline fractures

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 43-87. B4

PAGE 3 OF 3
4 of 4A

DATES DRILLED:
ELEVATION:
GEOLOGIST(S):
DATE:
CHECKED BY: USCS symbol DATE:

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	USCS SYMBOL	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 2 30.0	30.0 to 32.0		1.6 (1)	CL			Clay >80%	31		Clay Brownish gray to dk reddish brown (10R 3/4). Mod to high plasticity. Some iron staining in matrix
								32		Bottom of Boxes

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 43-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 7/31/89
CHECKED BY: DATE:

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 to 2.0		(1) .6	GW				>50% Gravel	0, 1, 2		Gravel, medium gray (N5), to very light gray (N7) to moderate orange pink (5YR 8/4) clay matrix is dark yellowish brown (10YR 4/2) subangular to rounded, poorly graded, max. size 6 cm, trace of root fragments.
	2.0 to 4.0		(1) .5						3		Gravel, very light gray (N8), subrounded to rounded, poorly graded max size 9 cm, trace of clay
	4.0 to 7.0		0						4, 5, 6, 7		No Sample
	7.0 to 7.5		(1) .5	GW					8, 9		As above (reference 20 to 40 ft in well) max. size 6 cm
	7.5 to 8.0		(1) .3								

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 43-17

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 7/21/89
CHECKED BY: DATE:

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (IN FEET)	SAMPLE NUMBER	FEET OF CORE	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	7.5 to 12.5 DCB		(1) .3	GC				>50% Gravel	11, 12	0 0 0 0	As above (reference interval 2.0 to 4.3 = 4.1)
	12.0 to 14.5		(1) .2						13, 14	0 0 0 0 0	
	14.5 to 17.5		0						15, 16, 17, 18, 19		No Sample
17.5	17.5 to 22.3		NJ	GM				>50% Gravel		0 0 0	Sandy Gravel, medium gray (NJ) to [illegible]

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 43-87 ?

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE:
CHECKED BY: DATE:

USCS symbol

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (interval)	SAMPLE NUMBER	FEET OF CORE IN BOX (interval)	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	[illegible] to [illegible]		ND	GM			[illegible]	21, 22		[illegible]
	~~[illegible]~~ DCB [illegible] TO [illegible] ~~[illegible]~~ DCB		0					23, 24		No Sample
	[illegible] to 26.0		0					25, 26		No Sample
	26.0 to 27.2		0					27		No Sample
	27.2 to [illegible]		(1) .8				>50% silt	28		[illegible] (10 YR 6/6) [illegible] not apparent, highly [illegible] friable, some clay [illegible]
	[illegible]		0					29		No Sample
	[illegible]		.9(1)				>50% clay			Claystone, grayish orange (10 YR 7/1).

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 43-87 ?

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCL
DATE:
CHECKED BY: DATE:

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (FT BELOW GL)	SAMPLE NUMBER	FEET OF CORE IN BOX	USCS SYMBOL	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	21.7 to 32.0		(1) .9						>50% clay	31		To yellowish [illegible] not apparently [illegible] [illegible]
	[illegible]		0							32		No sample
	32.2 to 34.7		ND						>50% clay	33, 34		As above (reference interval 21.7 to 32.0 ft.)
										35		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. DN 44-27

DATES DRILLED:
ELEVATION
GEOLOGIST(S): DCJ
DATE: 7/27/89
CHECKED BY: DATE:

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE (in ft. from surface)	SAMPLE NUMBER	FEET OF CORE (NUMBER IN PARENTHESES IF NO RECOVERY) / FEET OF SAMPLE OR RUN	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 to 2.0		(1) 1.7	GC				>50% Gravel	1		Clayey Gravel, variegated white, light gray, pink, dominant color is very light gray (N8), OCB clay matrix is dark reddish brown (10 R 3/4), angular to subrounded, moderately graded, maximum size 5.5 cm, roots and plant debris from 0.0 to 0.3 ft, some sand and silt
	2.0 to 3.8		(1) 1.6						2, 3		
	3.8 to 4.8		0						4		No Sample
	4.0 to 6.2		(1) 1.7	GM				>40% Gravel	5, 6		Sandy Gravel, light gray (N7), sand silt matrix is moderate yellowish brown (10 YR 5/4), poorly graded, max. size 4 cm, some silt, trace of clay.
	6.2 to 7.0		0						7		No Sample
	7.0 to 8.5		0						8		No Sample
	8.5 to 9.5		ND						9		As above (reference interval 4.0 to 6.2)
	9.5 to 10.4		.7(1)								

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH44-87

DATES DRILLED:
ELEVATION
GEOLOGIST(S) DCB
DATE 7/28/89
CHECKED BY: DATE.

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (in/ft)	SAMPLE NUMBER	FEET OF CORE IN BOX (in/ft)	USCS SYMBOL FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 1 / 6.4	7.5 to 10.4		.7	GM			>40' Gravel			As above (reference interval 4.0 to 6.2)
			0					11		No Sample
12.0	12.0 to 12.7		(1) .3	GM			>40' Gravel	12		As above (reference interval 4.0 to 6.2) two cobbles ~5 cm [illegible] at 12.0 ft (est. depth).
	12.7 to 15		0					13 / 14		No Sample. Note: crosses DCB 7/27/89 error in interval locations corrected.
Box 2 of 3	14.5 to 16.4		(1) 1.4	GM				15 / 16		As above w/ increase increase in silt below 15.0 ft ([illegible])
	16.4 to 17.0		0							No Sample. Silty Sand, pale yellowish brown (10 YR 6/2), angular to subrounded, moderately graded very coarse to very fine grained, some gravel
	17.0 to 18.3		(1) .8	SM			>40' Sand	17 / 18		
	18.3 to 19.5		0							No Sample
	19.5 to 22.[illegible]		ND	SM						As above (reference interval 17.0 to 18.3)

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. B4 44-87

DATES DRILLED
ELEVATION.
GEOLOGIST(S) DCB
DATE 7/28/89
CHECKED BY.
DATE.

USCS symbol

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	19.5 to 22.0		ND	SP GM				>40' sand 35' Gravel	21		DCB As above with increase in gravel fraction from at 20.5 ft % (est. depth) and decrease in silt fraction
	22.0 to 23.5		(1) .7						22 23		
	23.5 to 24.5		0						2		No Sample
	24.5 to 27.0		ND	GM SM				>40' sand 35' Gravel >50' silt	25 26		As above (reference interval 20.5 to 23.5
	27.0 to 27.0	GS	(1) .9	SP				>100' sand	27 28 29		Silt, pale yellowish brown (10 YR 6/2) some fine sand and gravel. Sand, grayish orange (10 YR 7/4), subrounded to rounded, poorly graded - fine grained to very fine grained, clean, siliceous.

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

Note - Ex sue 7/28/89 DCB corrected lith. description

LOG OF BORING NO. B4-44-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 7/28/87
CHECKED BY:
DATE:

USCS SYMBOL

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (FEET)	SAMPLE NUMBER	FEET OF CORE IN BOX	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 3 of 3	27.0 to 32.0		(1) 9	SP				100% sand	31		As above
	32.0 to 34.5		(1) 40	SM				>50% sand	32, 33		Sand, grayish orange (10 YR 7/4), subrounded to rounded, fine to very fine grained, poorly graded, some silt, trace of clay
								>50% clay	34		Silty claystone, grayish orange (10 YR 7/4), and very light gray (N8), bedding is graptic-highly weathered, moderately friable, some fine sand, localized iron staining
									35		Bottom of Box 3 of 3 at 34.5 DCB

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 44-87/BH 58-87 PAGE 1 OF 1

GEOLOGIST(S): DAJ
DATE: 8/16/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 -2.0						GC			OP 3 IN. SANDY GRAVEL, dusky yellowish brown (10 YR 2/2), sub angular-subrounded mod grading, max size = 5 cm, trace of clay, trace of roots.
							CL	1		Bottom of INTERVAL. CLAY, greyish orange (10 YR 7/4), mod-low plast, some sand, trace of carb. material
	2.0 -4.0						CL	2		Same as above
								3		
Box 1 of 1	4.0 -7.0						CL	4		Same as above; light grey (N7) in middle of interval. Increased amt of iron staining at base of interval.
								5		
								6		
7.0 ↑								7		
END OF BOXES								8		
								9		

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 45-87 BR

GEOLOGIST(S): DCB
DATE: 8/21/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
60.0 ↓	60.0 to 62.0	ND		40°		>50% clay		61, 62		claystone, medium light gray (N6) to medium gray (N5), bedding not apparent, slightly friable, localized iron staining and carbonaceous mineralization, slight silt component.
	62.0 to 63.8	ND						63		
	63.8 to 64.0	0						64		No Sample
	64.0 to 66.0	ND				>50% clay		65, 66		claystone - as above (reference interval 60.0 to 63.8) slickenside at ~65.2 ft, 60° attitude
Box 7 of 12	66.0 to 67.6	ND						67		
	67.6 to 68.0	0						68		No Sample
	68.0 to 70.0	ND				>50% clay		69		claystone - as above (reference interval 60.0 to 63.8)
↑ 70.0	70.0									

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

This series begins with box 7 of 12. Boxes 1/12-6/16 are not in the trailer

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 45-87 BR

GEOLOGIST(S): DCB
DATE: 8/21/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
		0						71		No Sample
72.0 ↓ Box 8 of 12	72.0 to 74.0	ND		70°	45°	>50% clay		72, 73		Claystone, medium light gray (N6) to medium gray (N5), bedding not apparent to thin (~2mm and less) horizontal, slight to moderate dip, slight to moderate friability, localized iron staining and iron staining on fracture, occasional carbonaceous mineralization, slight to moderate silt fraction
	74.0 to 75.5	ND						74, 75		
	75.5 to 76.0	ND						76		
	76.0 to 78.0	0						77, 78		No Sample
	78.0 to 82.0	ND			25°	>50% clay		79		Claystone as above (reference interval 72.0 to 76 ft)

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 45-87BR

GEOLOGIST(S): DCB
DATE: 8/21/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 8 of 12	78.0 to 82.0	ND				>50% clay		81		Claystone as above (reference interval 72.0 to 76.0 (B)).
82.0	82.0 to 86.0	ND						82, 83, 84, 85		
Box 9 of 12	86.0 to 89.5	ND						86, 87, 88, 89		
90.0	89.5 to 90.0	ND			<5°	>50% silt				Siltstone, light gray (N7), thin bedded (<2mm), slight'd p, slightly friable, carbonaceous mineralization occurs on partings.

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 45-87 BR

GEOLOGIST(S): DCB
DATE: 8/21/89

PROJECT NO: 667-11-22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
90.0 ↓	90.0				10°	~50% clay, ~50% silt; >50% clay		91		Interbedded siltstone and claystone, light gray (N7) to med. light gray (N6) respectively, thin bedded (<2mm) slight dip, slightly friable, slight component of vfg sand, localized iron staining, occasional carbonaceous mineralization
	to	N/D						92		
								93		claystone, medium light gray (N6), bedding not apparent, slightly friable, local iron staining, occasional carb mineralization on partings, slight vfg sand fraction
12	94.0							94		
	94.0 to 96.1	N/D						95		
	96.1					>99% sand		96		Sandstone, light gray (N8), bedding not apparent, slightly friable, well sorted, subrounded, local iron staining
Bot	96.1 to 97.0	0						97	X	No Sample
	97.0 to 101.0					>80% sand, 15% fine sand, ~5% c-g sand		98, 99		Sandstone as above (reference interval to 96.1 ft), slightly friable, occasional carb. mineralization, significant c-g fraction, local iron staining

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 45-87BR PAGE 5 OF 6

GEOLOGIST(S): DCB
DATE: 8/21/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Bot 100.12 ↑ 101.0	97.0 to 101.0			30°		>50% clay		101		Sandy claystone, very light gray (N8) to silty light gray (N7), bedding not apparent, slightly friable, local iron staining, sand is vfg.
		0						102		No Sample
102 ↓	102.0 to 106.0	NID				>50% clay		103, 104, 105		Sandy Claystone as above (reference interval 100.0 to 101.0 ft.).
	106.0 to 110.0	NID		30°		>50% clay		106, 107, 108, 109		Claystone, light gray (N7), bedding not apparent, slightly friable, localized iron staining and carb mineralization, moderate silt fraction
						>50% clay				Sandy claystone, light gray (N7), bedding not apparent, slightly friable, occasional iron staining, sand fraction is vfg
↑ 110										

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 45-87 BR PAGE 6 OF 6

GEOLOGIST(S): DCB
DATE: 8/21/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
110.0 ↓ Box 12 of 12 ↑ 112.0	110.0 to 112.0	NB		33°		>50% clay		111, 112		Claystone, light gray N7, bedding indistinct may dip ~40°, slightly friable significant silt fraction, occasional iron stains and carb. mineralization, slight component of vfg sand in silt-rich spots.
										Bottom of Box 12 of 12 at 112.0 ft.

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 46-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:

USCS symbol

DATE: 8/7/89

PROJECT NO: 667-11.22

Top/Bottom of Core in Box	Top/Bottom of Core (in Feet)	Sample Number	Feet of Core	Unit Symbol	Fractures per Foot	Fracture Angle	Bedding Angle	Grain Size Distribution	Depth in Feet	Lithologic Log	Lithologic Description
Box 1 of 3	0.0 to 2.0		1.1(1)	GC				Gravel >50% Clay >40%	1		Clayey gravel Gravel predominantly Med gray (N5) Angular to subrounded Moderately graded. Max size 5cm Clay matrix. Mod. brown (5yr 3/4). Est mod plast. Trace to some sand. V.F. to Coarse grained. Interval slightly calcareous
	2.0 to 4.0		1.4(1)	GC				Gravel >50% Clay ≥30%	2, 3		Same as above. Gravel mod well graded Matrix sandier + siltier
	4.0 to 7.0		1.9(1)	GC			LA	Gravel ≥50% Sand ≥25% Clay ≥25%	4, 5, 6		Sandy, clayey gravel Gravel predom med. gray (N/5). Sub angular to sub rounded. Mod grading max size 7cm Matrix very pale orange (10yr 8/2) to grayish orange (10yr 7/4) Clayey sand well graded silt to granules Subangular to sub rounded Matrix slightly calcareous
	7.0 to 9.5		2.0(1)	GC				Gravel ≥50% Sand ≥25% Clay ≥25%	7, 8, 9		Same as above, ~~non-calcareous~~ LA

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 46-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:

USCS symbol

DATE: 8/7/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	~~FEET OF CORE IN BOX~~	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 3	9.5 to 12.0		.8(1)	GC				Gravel ≥50% Sand ≥25% Clay ≥25%	10.1		Sandy clayey gravel Gravel predom. med. gray (N5) ~~Sub~~ LA Angular to sub rounded. Mod grading. Max. size 7cm Matrix grayish ~~edge~~ orange (10yr 7/4) clayey sand well graded - silt to granules. Sub angular to subround Slightly calcareous
	12.0 to 14.5		~~2.6(1)~~ 1.8(1)	GC				Gravel ≥50%	14.2		Same as above Gravel well graded. non-calcareous
Box 2 of 3	14.5 to 17.0		1.0(1)	GC				Gravel ≥50%	15, 16, 17		Same as above Max gravel size: 6 cm
	17.0 to 19.5		.4(1)	GC				Gravel ≥50%	18, 19		Same as above.

Begin Box 2

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 46-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:
DATE: 8/7/89
PROJECT NO: 667-11.22

USCS symbol

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET (INTERVAL)	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 3	19.5 to 22.0		1.75(1)	GC				Gravel >50%	21, 22		Clayey, sandy gravel Gravel predominantly Med dark gray (N4) Mod well graded Angular to subangular Max. size 6.5cm Matrix. Lt brown (5yr 6/4) sandy clay Est plast. low to moderate. Sand fine to granules.
	22.0 to 24.5		.78(1)	GC				Gravel >50%	23, 24		Same as above
	24.5 to 27.0		.2(1)	GC				Gravel >90%	25, 26		Same as above, poorly graded ~~Sort~~ LA (only 2 cobbles, some sandy clay
	27.0 to 29.0		2.45(1)	CL				Clay >50%	27, 28		* Silty clay yellowish gray (5y 8/1) to dark yellowish orange (10yr 6/6) Est plast. moderate. Some carb. material Trace gravel.
	29.0 to 29.5		0	~~Ø~~ LA					29		No Sample

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

* Had to erase graphic log to correct. LAA 8/7/89

LOG OF BORING NO.

BH 46-87 ?
JWL

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): UAA
DATE:
CHECKED BY:
DATE: 8/7/89

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE IN BOX	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	29.5			CL				Clay ≥50%			Silty clay yellowish gray (5y 8/1) to grayish orange (10yr 7/4). Est plast. moderate. Some carb material. Grades to clayey silt
Box 2 of 3	to		2.0(1)						31		
32.0	32.0			ML				Silt ≥50%	32		
									33		Bottom of Boxes *

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

Box 3 of 3 ~~has~~ contains only sample jars

LOG OF BORING NO. 47-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): UAA
DATE:
CHECKED BY:
USCS symbol
DATE: 8/8/89
PROJECT NO: 667-11.22

Depth Scale	Depth Scale	Sample No.	Recovery	Blows	Field Test	Lab Test	Lab Test	Graphic Log	Depth in Feet	Sample No.	LITHOLOGIC DESCRIPTION
	0.0							Clay >50% Silt >20%	1		Silty gravelly clay. Grayish brown (5YR 3/2). Est. plast. moderate. Gravel angular to sub rounded. Max size 2.5cm. Some med grained sand Some gross + root material @ surface
	2.0			13 (1)	CL				2		
	2.0			1.85 (1)	CL			Clay >50% Silt ≈10%	3		Silty clay. Grayish orange (10yr 7/4.) Est Plast. Moderate Trace small gravel + root material. Trace fine grained sand Slightly calcareous Gravelly interval (.5 in) @ bottom. Gravel angular max size 6cm Probably a ground cobble from drilling
	4.0								4		
	4.0			.35 (1)	CL			Clay >50% Sand ≈30%	5		Sandy Clay Grayish orange (10yr 7/4). Est plast low to moderate. Sand well graded, vfg. to coarse grained sub angular to sub rounded Some small gravel Some $CaCO_3$ Trace roots
									6		
	7.0								7		
	7.0			1.6 (1)				Clay >50 Silt ≈30%	8		Silty clay. Grayish orange (10yr 7/4) Est. plast. Moderate Calcareous. Lg. Cobble sub angular. 7cm
									9		Silty Claystone Very pale orange. (10yr 8/2) slightly mottled appearance Mod. weathered. Slightly friable Iron staining in some healed fractures
	9.5										
	9.5										

Box 1 of 3

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 47-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:

USCS symbol

DATE: 8/8/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FOOT (IN FEET)	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 3	9.5 to 12.0		2.75 (1)					Clay >50% Silt ~30%	11		Silty claystone. Very pale orange (10yr 8/2) and dk yellowish orange (10yr 6/6.) Mottled Mod. weathered, slightly friable Iron staining in some healed fractures Some CaCO3
12.8	12.0 to 12.8		1.8 (1)					↓	12		Same as above CaCO3 in healed fractures instead of iron staining
	12.8 to 14.5		1.8 (2)					Clay >50% Silt >40%	13, 14		Silty claystone Very pale orange to pale yellowish orange. (10yr 8/2 to 8/6) Highly weathered, Mod. to highly friable, Calcitic. Some iron staining
	14.5 to 17.0		2.45 (2)					Clay >50% Silt >40%	15, 16		Same as above. Some carb material. Calcite content decreasing toward bottom.
	17.0 to 19.5		2.6 (2)					Clay >50% Silt ~30%	17, 18, 19		Same as above Iron staining in fractures Slightly less silt.

Begin Box ↓

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(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 47-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:

USCS symbol

DATE: 8/8/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET (FT. BELOW)	SAMPLE NUMBER	FEET OF CORE (FT. BELOW)	FEET OF CORE IN BOX	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION	
Box 2 of 3	21.2		1.6 (2)					Clay >50%	21		Silty Claystone Dk. yellowish orange (10yr 6/6) to yellowish gray (5y 8/1). Highly weathered. Mod. to highly friable Some iron staining in cracks Some carb material	
Box 3 of 3	21.2 22.0		1.1 (2)					Clay >50%	22		Silty Claystone - Same as above	Begin New Box
									23		Bottom of Boxes	
									24			
									25			
									26			
									27			
									28			
									29			

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 48-87

GEOLOGIST(S): TSD
DATE: 7/19/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓ Box 1 of 2	0.0 to 2.0	(1) 0.75					CL	1, 2		Sandy clay - brownish gray (5YR 4/1), medium plasticity some gravel (max size = 7cm)
	2.0 to 4.0	(1) 1.04				5cm to 2mm = 60% VCG to CG = 20%, Fines = 20%	GC	3		Sandy clayey gravel dominantly medium gray (N5) angular to subangular moderately graded
	4.0 to 6.0	(1) 2.0					CL	4, 5		Clay light olive gray (5Y 6/1) medium plasticity, some silt, trace of fine sand.
	6.0 to 8.0	(1) 2.26					CL/?	6, 7		Top 1/3 of interval is same as above the bottom 2/3 consists of the following: clay + calcareous mineralization - pale yellowish brown + white (N9), trace of sand + gravel.
↑ 10.4	8.0 to 10.0	(1) 2.5					CL	8, 9		Silty clay pale yellowish brown (10YR 6/2) medium plasticity, some fine to medium sand, trace of gravel. (Top 1/4 of interval is the same as the previous interval with less calcite)

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

This log has been re-copied to include correct graphic lithologic log. CKF

ROCKY FLATS PLANT

FIGURE NO.

VCG = very coarse grained sand
CG = coarse grained sand
MG = medium grained sand
FG = fine grained sand

BG background = ~50-300 cpm
BG Core Box 1 = 50-200 cpm

LOG OF BORING NO. 48-87

GEOLOGIST(S): TSD
DATE: 7/19/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
10.4	10.0 to 10.4	(1) 0.44					CL			Clay - light brownish gray (5YR 6/1) high plasticity, trace of fine sand + silt, trace of iron staining.
10.4 ↓	10.4 to 12.0	(1) 1.27					CL	11		First half of interval is same as above. Second half consists of the following: fine sandy siltstone highly weathered yellowish gray (5Y 8/1) with dark yellowish orange staining (10YR 6/6).
Box 2 of 2	12.0 to 14.0	(1) 2.27						12, 13		Same as above with a trace of carbonaceous material + thin fine sand lenses (horizontal predominantly)
14.7	14.0 to 14.7	(1) 1.0						14		Same as above, unable to identify if sand lenses exist (too crumbly).
								15		Bottom of Boxes

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 48-87

DATES DRILLED
ELEVATION
GEOLOGIST(S) TSD
DATE
CHECKED BY DATE 7/19/88

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN BOX (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	USCS SYMBOL ~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 TO 2.0		0.75 (1)	CL				1		Sandy clay - brownish gray (5YR 4/1), medium plasticity Some gravel (max size = 7cm)
	2.0 TO 4.0		1.04 (1)	GC			Sem to 2mm = 60% VCG TO CG = 20% Fines = 20%	2 3		Sandy clayey Gravel dominantly Medium gray (N5) angular to subangular moderately graded
Box 1 of 2	4.0 TO 6.0		2.0 (1)	CL				4 5		Clay light olive gray (5Y 6/1) medium plasticity, some silt, trace of fine sand
	6.0 TO 8.0		2.26 (1)	CL/?				6 7		Top 1/3 of interval is same as above. The bottom 2/3 consist of the following: clay & calcarious mineralization - pale yellowish brown & white (N9), trace of sand & gravel
↑ 10.4	8.0 TO 10.0		2.5 (1)	CL				8 9		Silty Clay pale yellowish brown (10YR 6/2), medium plasticity, some fine to medium sand, trace of gravel. (Top 1/4 of interval is the same as the previous interval w/ less calcite).

NOTES General. The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

VCG = Very coarse grained sand
CG = Coarse grained sand
MG = Medium grained
FG = Fine grained

BH Background = 250-300 cpm
BH - core Box 1 = 50-200 cpm

LOG OF BORING NO. 48-87

DATES DRILLED
ELEVATION
GEOLOGIST(S) TSD
DATE
CHECKED BY
DATE 7/19/88

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	USCS symbol ~~FEET OF CORE IN ROW~~	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
10.4	10.0 to 10.4		0.41	CL						Clay - light brownish gray (5YR 6/1) ~~medium to~~ high plasticity, trace of fine sand & silt, trace of iron staining.
10.4 ↓	10.4 TO 12.0		1.27 (1)	CL –				11		First half of interval is same as above, second half consists of the following: fine sandy siltstone highly weathered yellowish gray ~~of~~ (5Y 8/1) with dark yellowish orange staining (10YR 6/6)
Box 2 of 2	12.0 TO 14.0		2.27 (1)	–				12, 13		Same as above with a trace of carbonaceous material + thin fine sand lenses (horizontal predominantly)
↑ 14.7	14.0 TO 14.7		1.0 (1)	–				14		Same as above, unable to identify if sand lenses exist (too crumbly).
								15, 16, 17, 18, 19		Bottom of Box 2

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(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH47-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSO
DATE:
CHECKED BY:

USCS symbol

DATE: 8/3/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 TO 2.0		0.65 (1)	GP				>50% is >4mm	1		Gravel - predominantly mod. orange pink (10 R 7/4) subangular to subrounded, poorly graded max size = 5.5 cm, some sand & clay (grayish brown (5YR 3/2)) trace of $CaCO_3$
	2.0 TO 4.0		0.8 (1)	GP/GW				>50% is >4mm	2, 3		Gravel - predominantly lt gray (N7) angular to subrounded, mod. sorted max size = 6 cm, some sand & clay, calcareous.
	4.0 TO 5.7		0.85 (1)	GP/GW				>50% is >2mm	4, 5		Same as above; trace of ~~no~~ clay
Box 1 of 2	5.7 TO 8.0		0	GM					6, 7		Silty Gravel - predom - med. lt gray (N6) floury angular to subrounded mod graded, max size = 3.5 cm, some V.F.G. sand to C.G. sand trace of clay, calcareous (silt color = grayish orange (10 YR 7/4))
	8.0 TO 9.3		0.5 (1)						8, 9		
	9.3-9.5		0								
											See Next pg

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. B147-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSP
DATE:
CHECKED BY:
USCS symbol
DATE: 8/3/87
PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN FEET	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE RECOVERED	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	9.5 TO 11.0		(1) 0.9	GW					11		Gravel - predom. lt gray (N7) angular to subangular, mod. well graded, max size = 5.5cm some sand, + silt, some $CaCO_3$
	11.0 - 11.5		0								No Sample
	11.5 TO 13.0		(1) 0.6	GW/GC					12		Same as above; less silt some clay
	13.0 - 13.5		Sample Jars						13		No Sample
2	13.5 TO 15.0		(1) 0.95	GW/GC					14		Gravel predom lt gray (N7) angular to subrounded, mod. well graded, max size = 4cm, some silt, sand, + clay
4 0	15.0 TO 16.0		Sample Jars						15		No Sample
BOX 1	16.0 TO 18.0		(1) 1.0	GW/GC					16 17		Same as above; max size = 7cm
↑ 18.0									18		No Sample
18.5 ↓	18.5 TO 20.5		(1) 1.4	GC				75% is 22mm	19		Clayey sandy gravel - clay matrix is lt. brown (5YR 5/6) - gravel is subangular to subrounded, mod. well graded, max size = 6cm
BOX 2 of 2											

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(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH47-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD
DATE:
CHECKED BY:
DATE: 8/3/87
PROJECT NO: 667-11.22

USCS symbol

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	USCS symbol	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 2	20.5 TO 22.5		ND	GW				>50% is >2mm	21, 22		Sandy gravel - grayish orange (10YR 7/4) angular to subrounded well graded, max size = 6.5cm. some clay.
	22.5 TO 24.5		(1) 0.95	GW				>50% is >2mm	23, 24		Same as above
	24.5 TO 25.5		ND	GP				>50% is >2mm	25		Same as above; gravel is poorly graded (mostly ≈ 4mm) max size = 3.5cm
	25.5 TO 27.2		0 ~~0.55~~ ~~ND~~						26, 27		No Sample
↑ 28.2	27.2 TO 28.2		(1) 0.55						28		Clayey siltstone - yellowish gray Bedding nonevedent, well weathered mod. friable, trace of carbonaceous material, iron staining, + F.G. Sand
									29		Bottom of boxes

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 48-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DAT
DATE:
CHECKED BY: USCS symbol
DATE: 8/8/89

PROJECT NO: 667-11.22

Top/Bottom Depth in Core	Top/Bottom Depth in Hole	Sample Number	Percent Recovery	USCS Symbol	Fractured Per Foot	Fracture Angle	Dominant Angle	Blow Size Bit Type	Depth in Feet	Lithologic Log	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0-2.0		(1) 1.4	CL					1		TOP 1 FT. - SANDY CLAY, DUSKY YELLOWISH BROWN (10 YR 2/2), EST. LOW PLAST., (ERASER dry) CALCAREOUS MATERIAL, SOME ROOTS. BOTTOM 1 FT - CALICHE, MODERATE ORANGE PINK (5 YR 8/4), SOME GRAVEL, MAX GRAVEL SIZE = 4 CM, SOME CLAY, SOME SAND
	2.0-4.0		(1) 1.25						2, 3		TOP 1 FT - SAME AS ABOVE. BOTTOM 1 FT - SAME AS ABOVE W/ MORE GRAVEL
	4.0-6.0		(1) 1.45	GC					4, 5		CLAYEY GRAVEL - LIGHT BROWN (5 YR 5/6), ANGULAR-SUBANGULAR, MOD GRADING, MAX SIZE = 5.5 CM, SOME SAND, SOME CALCAREOUS MATERIAL, GRAVEL SIZE BECOMING LARGER AT BOTTOM OF INTERVAL.
	6.0-8.0		(1) 0.95	GC					6, 7		SAME AS ABOVE - BOTTOM OF INTERVAL IS MODERATE BROWN (5 YR 4/4), SUBANGULAR - SUB ROUNDED, MAX GRAVEL SIZE = 3 CM, NO CALCAREOUS MATERIAL, INCREASED AMT OF SAND
↑ 10.0	8.0-10.0		(1) 1.10	GC CL					8, 9		TOP 6 IN - SAME AS ABOVE CALCITE AT TOP OF 6 IN OF INTERVAL. BOTTOM OF INTERVAL CLAYEY SAND, LIGHT BROWN (5 YR 5/6) TO VERY PALE ORANGE (10 YR 8/2), ANGULAR - SUBANGULAR, MOD - POORLY GRADED, SOME SILT.

Box 1 of 2

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 48-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DAT
DATE:
CHECKED BY:

USCS symbol

DATE: 8/8/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN BOX	SAMPLE NUMBER	FEET OF CORE	USCS symbol	FRACTURES PER FOOT	FRACTURE ANGLE	DESIGNS ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
10.0 ↓	10.0 -11.5		(1) 0.8	GC					11		CLAYEY GRAVEL, LIGHT BROWN (5 YR 5/6) ANGULAR-SUBANGULAR, MOD-WELL GRADED MAX SIZE = 6 CM, SOME SAND, SOME SILT
Box 2 of 2	11.5 -13.2		∅						12, 13		SAMPLE JARS
	13.2 -15.2		(1) 1.8	CL					14, 15		SANDY CLAY - PINKISH GREY (5 YR 8/1), MOD-HIGH PLASITITY, SOME SILT SAME AS ABOVE
17.35	15.2 -17.35		(1) 1.7	CL					16, 17		
END OF BOXES	~~END OF BOXES~~								18, 19		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 4987

DATES DRILLED:
ELEVATION
GEOLOGIST(S): [illegible] USCS symbol
DATE 7/15/89
CHECKED BY. DATE.

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FOOT INTERVAL	SAMPLE NUMBER	FEET OF CORE IN BOX	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
TOP Box 1 of 1	~~Box~~ 0.0 to 1.3		1.1 (1)					CLAY >50%	1.0		SILTY GRAVELY CLAY, MODERATE BROWN (5Y 3/4), LOW TO MODERATE PLASTICITY SOME ROOTS, SAND AND SILT
	1.8 to 4.0		.5' (1)					SAND >50%	3.0		AT 1.65 INTERVAL GRADES INTO A CLAYEY SAND, GREYISH ORANGE (10 YR 7/4) ANGULAR TO SUBANGULAR, MODERATELY GRADED, SOME GRAVEL
	4.0 to 7.0		.45' (1)					Clay >50%	4.0		CLAY, GREYISH ORANGE (10 YR 7/4), HIGH PLASTICITY, SOME GRAVEL, SLIGHTLY MOIST.
	7.0 to 9.0								7.0		
Box Bottom 10.0	9.00 to 10.00		ND					Clay >50%	9.0		CLAYSTONE, (LIGHT GREY N7), HIGHLY WEATHERED BEDDING NOT APPARENT IRON STAINING ON FRACTURES, LOCALIZED CARBONATE MINERALIZATION.

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

BS 50-200 cpm
BACKGROUND 50-150 cpm

LOG OF BORING NO. BH 4987

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): GCB
DATE: 8/3/89
CHECKED BY:
DATE:
USCS SYMBOL
PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Top of BOX 0.0	0.0 to 2.0		1.9'	GP				GRAVEL >50%	2.0		CLAYEY SANDY GRAVEL, MODERATE BROWN (5 YR 3/4), SUBANG. TO SUBROUND, MODERATELY GRADED, 4 cm ø MAX SIZE GRAVEL, SOME PLANT-ROOT REMAINS
	2.0 to 4.0		1.6'	GP				GRAVEL >50%	4.0		CLAYEY SANDY GRAVEL, MODERATE ORANGE PINK (5 YR 8/4), ~~[illegible]~~ SUBANGULAR TO SUBROUNDED, MODERATELY GRADED, 5 cm ø MAX SIZE GRAVEL, CLAY FRACTION IS CALCAREOUS.
	4.0 to 6.0		1.6'	GP				GRAVEL >50%	6.0		AS ABOVE, COLOR IS VARIEGATED, PALE YELLOWISH ORANGE (10 YR 8/6) TO/AND MODERATE ORANGE PINK (10 YR 7/4).
	6.0 to 8.0		1.6'	GP				GRAVEL >50%	8.0		AS ABOVE, COLOR IS GRAYISH ORANGE (10 YR 7/4).
Top of BOX 0	8.0 to 10.0		1.2'	GP				↓			AS ABOVE ↑

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
1) Badly broken core, accurate footage measurement not possible.
2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 4987

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): GCE
DATE: 8/3/89
CHECKED BY:
DATE:

USCS SYMBOL

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FT.	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Top of box 2/4 (100)	10.0 to 12.0		1.5					FINES =10% GRAVEL >50%			SANDY GRAVEL, GREYISH ORANGE (10 YR-7/4) ANGULAR TO SUBROUNDED, MODERATE TO WELL GRADED, MAX SIZE 4 cm Ø, SOME CALCAREOUS CLAY
	12.0 to 14.0		1.5						12.0		AS ABOVE
	14.0 to 16.0		1.8						14.0		AS ABOVE
	16.0 to 18.0		1.5						16.0		AS ABOVE
0.0 1m box 2	18.0 to 20.0		1.5						18.0		AS ABOVE

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO.

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): GCE
DATE: 8/3/89
CHECKED BY:

BH 4987

USCS symbol

DATE:

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROCK	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Top of Box 3 (20.0)	20.0 to 22.0		1.2						22.0		AS ABOVE (pg 2)
	22.0 to 24.14		1.85						23.0		CLAYSTONE, LIGHT GREY (N7), BEDDING NOT APPARENT, ~~[illegible]~~ MODERATE TO VIGILY FRIABLE, IRON STAINING ON FRACTURED SURFACES
Bottom of Box 25.84	24.14 to 25.84		ND						24.0 / 25.0		
4/4											END OF BOX 3/4 BOX 4/4 VOA'S AND FIELDING SCREENINGS.

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 50-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:
USCS symbol
DATE: 8/2/89
PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FOOT	SAMPLE NUMBER	FEET OF CORE	USCS symbol	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 to 2.0		1.3(1)	CL				Clay >60%	1		Silty gravelly clay Grayish brown. 5yr 3/2 moderate plasticity Some sand & surficial root material Gravel to ≈ 4cm Abundant Calcite Grades downward into gravel in a Caliche matrix
	2.0 to 3.4		1.15(1)	GC				Gravel >50%	2, 3		Gravel in caliche matrix gravel med dk gray (N4). Angular to sub angular Mod sorted/graded Matrix also has some clay Max size gravel 5cm
	to 4.0		0 LA ~~.25(1)~~						4		No Sample
	to 4.3		.25(1)	GC				Gravel >50%			Same as above, more clay in matrix, less caliche Gravel smaller max 2cm
	to 5.1		8(1)	GC					5		Same as above Max size gravel: 6.5cm
	5.1 to 7.0		0 LA ~~.3(1)~~						6		No Sample
	to 7.5		.3(1) ~~1.1~~ LA	GC				Gravel >80%	7		Clayey Gravel Med dk gray (N4) Angular to subangular Mod graded Max size 6cm Matrix moderate yellowish brown (10yr 5/4) Silty sandy clay Mod. plasticity, slightly calcitic
	7.5 to 8.9		1.1(1)	GC				Gravel ≈50% Clay 30% Caliche 20%	8		Gravel in caliche and clay Gravel as above max size 6cm Clay matrix as above some black carbonaceous material
	to 9.5		0						9		No Sample
	to 9.8		2(1)	GC				Grav 50%			same as above matrix siltier, less hard less caliche.

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 50-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:
USCS Symbol
DATE: 8/2/89
PROJECT NO: 667-11.22

	TOP/BOTTOM OF CORE IN FEET	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE RECOVERED	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION	
* Box 1 of 3	9.8 to 10.8			.8 (1)	GC				Clay >50%			Silty gravelly clay. Grayish orange (10yr 7/4). Low to mod plasticity. Some sand. Gravel angular to subangular max size 5cm mod grading. Slightly calcareous	
	10.8 to 12.0			.2 (1)	GC					11		Same as above	
12.0 ↓	12.0 to 17.0			4.3 (1)	CL				Clay >95%	12, 13, 14, 15, 16		Clay Very pale orange to dark yellowish orange (10yr 8/2 to 10yr 6/6) Moderately high plasticity. Slightly silty in some areas. Trace carbonaceous material	Begin Box 2
* Box 2 of 3	17.0 to 19.5			4.0 (1)	CL					17, 18, 19		Same as above	
												Bottom of Boxes	Bottom

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ASI

ROCKY FLATS PLANT

FIGURE NO.

Box 3 of 3 were VOA Bottles only.

LOG OF BORING NO. 50-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:
DATE: 8/4/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 to 2.0		1.5(1)	CL				Clay >50% Gravel ≥30%	1, 2		Gravelly Clay. Grayish brown (5yr 3/2) Est. plast.-moderate. Gravel, Angular to Subrounded Mod. Grading. Some sand Surficial roots + grass present at top of interval
	2.0 to 4.0		1.7(2)	CL				Clay >90%	3, 4		Clay Lt. brownish gray (5 yr 6/1) Est plast. Mod to mod. high Trace sand. Some calcite. Becomes mostly caliche lasts 8 of interval
Box 1 of 3	4.0 to 7.0		~~1.8(2)~~ LA 3.1(2)	CL				Clay >80%	5, 6, 7		Clay Grayish orange (10yr 7/4) to very pale orange (10 yr 8/2) Est plast moderate Very calcitic, caliche in areas Some sand (med grained.)
	7.0 to 9.2		2.15(2)	CL				Clay >80%	8, 9		Same as above Caliche stringers. Trace gravel
9.2	9.2 to 9.5		4(2)	CL				Clay >80%			Clay Grayish orange (10yr 7/4). Est plast mod to high. Some gravel. Some sand Some caliche clasts matrix slightly calcitic — Begin Box 2

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 50-87 BUA

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): UAA
DATE:
CHECKED BY:
DATE: 8/4/89

PROJECT NO: 667-11.22

Box	Top/Bottom of Core Run	Top/Bottom of Core Run (Depth)	Sample Number	Feet of Core Recovered	USCS Symbol	Fractures per Foot	Fracture Angle	Bedding Angle	Clay Size Distribution	Depth in Feet	Stratigraphic Log	LITHOLOGIC DESCRIPTION
Box 2 of 3	9.5 to 12.0			2.7 (2)	CL				Clay >70%	11, 12		~~Clay~~ Clay. Grayish orange (10yr 7/4) Est. plast. mod. to high. Some gravel, some sand. Some caliche clasts. Matrix slightly calcitic
	12.0 to 14.5			2.4 (1)	CL, ML				Clay >70%	13, 14		Same as above. Grades to clean silt. yellowish gray to dk. yellowish orange 10yr 6/6. Calcitic in areas. Slightly calcitic matrix. Iron oxide concretion at bottom of interval
	14.5 to 17.0			2.5 (1)					Silt >50%	15, 16		Clayey siltstone. Dark yellowish orange to very pale orange (10yr 6/6 to N4yr 8/2). Gradational contacts. Horizontal Bedding. Highly weathered. Slightly to moderately friable. Ironoxide concretions @ top of interval
	17.0 to 17.6			7 (1)					Silt >50%	17		Same as above. Color more homogenous at grayish orange (10yr 7/4). No iron concretions. Moderately friable
Box 3 of 3	17.6 to 19.5			1.45 (1)					Silt >60%	18, 19		Siltstone. Very pale orange to dark yellowish orange (10yr 8/2 to 10yr 6/6). Bedding not apparent. Highly weathered. Moderately friable. Begin New Box

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 50-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:

USCS symbol

DATE: 8/7/89

PROJECT NO: 667-11.22

Top/Bottom of Core in Box	Top/Bottom of Core in Box (in feet)	Sample Number	Feet of Core	Feet of Core	Fractures per Foot	Fracture Angle	Bedding Angle	Grain Size Distribution	Depth in Feet	Lithologic Log	Lithologic Description
Box 3 of 3	19.5 ↓ ↑ 22.0	~~2.1~~ (1)	2.1 (1)					Silt >50%	21, 22		Clayey Siltstone Grayish orange to dk yellowish orange (10yr 7/4 to 10yr 6/6) Bedding appears horizontal, gradational. Some thin (≈ 1cm) more clayey layers w/iron staining at top of interval Some very fine sand to fine sand in areas near bottom. ~~Some~~ Trace carb material near bottom Highly weathered mod friable.
	22.0 ↓ ↑ 24.5		2.25 (1)					Clay ≥33% Sand ≥33% Silt ≥33%	23, 24		Clayey Silty sandstone interbedded w/silty claystones Grayish orange to dk yellowish orange (10yr 7/4 to 6/6) Bedding not apparant Highly weathered, moderately friable Sandstones very fine grained. Well sorted Some iron stained vertical(?) fractures
↑ 27.0	24.5 ↓ ↑ 27.0		3.0 (1)					↓	25, 26, 27		Same as above Sandstones very fine grained Some horizontal bedding visible Some carb material.
											Bottom of Boxes

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 51-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): GCE
DATE: 3/2/89
CHECKED BY:
DATE:

USCS SYMBOL

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Top of Box 1/1 ↑ 100	0.0 to 2.0		1.85 ft	Gp				GRAVEL >50%			UPPER 1.65 ft IS CLAY/GRAVEL, DARK YELLOWISH BROWN (10 YR 4/2), [CLAY MATRIX], SUBANGULAR TO ROUNDED, MODERATE TO WELL GRADED, MAX CLAST SIZE 4 cm ø, GRASS-PLANT REMAINS UPPER WT. 2 FT.
	2.0 to 3.7		1.55 ft	CL				GRAVEL ≈10%	2.0 / 3.0		CALICHE, VERY PALE ORANGE (10 YR 8/2), SOME GRAVEL AND SAND, GRAVEL IS SUBROUNDED TO ROUNDED, MAX SIZE IS 5 cm ø
	3.7 to 4.0		NO SAMPLE						4.0		NO SAMPLE
	4.0 to 4.4		ND								SAME AS ABOVE ↑
	4.4 to 6.0		1.85 ft	CL							
	6.0 to 7.0		NO SAMPLE						6.0		NO SAMPLE
Bottom of Box 1	7.0 to 9.0		1.35 ft	Gw				GRAVEL >50%	7.0 / 9.0		SANDY ↓ ~~CLAYEY (CALICHE)~~ GRAVEL, (GRAYISH ORANGE 10 YR 4/4), ROUNDED TO SUBANGULAR, WELL GRADED, MAX. SIZE 8 cm ø, SOME CALICHE PRESENT (CALCAREOUS CLAY)
9.5 ↓	9.0 to 9.5		NO SAMPLE								NO SAMPLE
Top of Box 2 9.5	9.5 to 12.0		.6 ft	↓				SEE BELOW			SEE BELOW ↓

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 5187

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): GCE
DATE: 8/3/89
CHECKED BY:
DATE:

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE RECOVERED	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	Cont'd 9.5 to 12.0		.6 ft	SC				GRAVEL + SAND >50%	11		CLAYEY SAND, (GREYISH ORANGE 10 YR 4/4), SUBANGULAR TO ROUNDED, MODERATELY WELL GRADED, MAX SIZE 3 cm ϕ, SOME CALCAREOUS CLAY AND GRAVEL PRESENT
	12.0 to 14.5		ND	SC					12, 14		SAME AS ABOVE, AT 13.2 IN INTERVAL CALCEROUS CLAY IS ABSENT, COLOR CHANGE TO LIGHT BROWN (5 YR 5/6).
	14.5 to 17.0		2.3 ft	SC / ML				FINES >50%	16, 17		CLAYEY SAND, LIGHT BROWN (5 YR 5/6), SUBROUNDED TO ROUNDED, POOR TO MODERATE GRADING, MAX SIZE 2 cm. ϕ, SOME GRAVEL AT 15.8 INTERVAL CHANGES TO A SANDY SILT, VERY PALE ORANGE (10 YR 8/2), VERY LOW PLASTICITY, VERY LITTLE CLAY PRESENT
Bottom of Box 2 7.5	17.0 to 19.5		2.3 ft	ML					19		SAME AS ABOVE
Bottom											Bottom of Box 1

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 44-87

PAGE 1 OF 1

"Field Screens"

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 7/23/89
CHECKED BY:
DATE:

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (MEASURED)	SAMPLE NUMBER	FEET OF CORE IN BOX (MEASURED)	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
											Box of 20 soil and water sample jars with samples. No record of Depths

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 51-87BH62-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD
DATE:
CHECKED BY:
DATE: 8/1/89
USCS symbol
PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 TO 2.0		0.15	—					1	—	ASPhalT
	2.0 TO 4.0		(1) 0.8						2, 3		Sandy gravelly clay - grayish orange (10YR 7/4) - med plasticity some calcareous material max gravel size = 5.5cm, trace of iron staining
	4.0 TO 6.0		(1) 1.2						4, 5		Same as above
	6.0 TO 8.0		(1) 1.8						6, 7		Same as above.
	8.0 TO 10.0		0						8, 9		NO Sample

Box 1 of 2

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 51-87/BH62-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD
DATE:
CHECKED BY:

DATE: 8/1/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN FEET	TOP/BOTTOM OF CORE IN FEET (MSL)	SAMPLE NUMBER	FEET OF CORE (MSL)	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	10.0 TO 12.0		0						11		NO SAMPLE
	12.0 TO 12.5		0						12		
	12.5 TO 14.0		23.0 0 0.9						13		Same as below
	14.0 TO 16.0		2.8 (1)						14 15		Silty claystone, light brownish gray (5YR 6/1), massive bedding ?, highly weathered, moderately friable, trace of iron staining to medium gray (N5)
	16.0 TO 18.0		1.7 (1)						16 17		Same as above w/ some organic material
									18		BOTTOM OF BOXES
									19		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(1) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH-4587

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSO
DATE:
CHECKED BY:
USCS & Symbol
DATE: 8/3/89
PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BH	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE RECOVERED	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
5.0 ↓	0.0 TO 2.0		1.2 (1)	CL					1		Gravelly Clay - grayish brown (5YR 3/2), med. plast, some sand, trace of silt.
	2.0 TO 3.2		0.7	GC				75% is 72mm	2, 3		Gravel - matrix color = dk yellowish brown (10YR 4/2), angular to sub-rounded, well graded, max size = 4.5cm, some clay + sand, calcareous. (floury texture)
	3.2 TO 4.0		0						4		No Sample
Box 1 of 5	4.0 TO 6.4		1.9 (1)	GW				75% is 75mm	5, 6		Gravel - med lt. gray (N6) angular to subangular, well graded, max size = 6.5cm, some sand, trace of clay (floury texture), calcareous.
↑	6.4 TO 7.0		0						7		
7.5	7.0 - 7.5		ND	GW				75% is 72mm			Same as above; max size = 3.5cm.
7.5 ↓ Box 2 of 5	7.5 TO 9.5		1.3 (1)	GW				75% is 72mm	8, 9		Same as above; max size = 5.5cm

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core wedges cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH45-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSO
DATE:
CHECKED BY:
USCS SYMBOL
DATE: 8/3/89
PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FOOT	SAMPLE NUMBER	FEET OF CORE	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 5 ↑ 14.5	9.5 TO 12.0		1.45 (1)	GW				>50% is >5mm	11		Gravel - matrix is grayish orange (10YR 7/4), angular to subrounded, mod. well graded some sand & clay (floury texture), calcareous., max size = 6cm
	12.0 TO 14.5		1.5 (1)	GW				>50% is >5mm	12, 13, 14		same as above
14.5 ↓	14.5 TO 16.5		1.0 (1)	GC/CL					15, 16		Sandy gravelly clay - grayish orange (10YR 7/4), est. low plasticity, slightly calcareous (max gravel size = 7.5cm
Box 3 of 5	16.5 TO 17.5		0						17		No Sample
	17.5 TO 20.0		1.15 (1)	GP					18, 19		Sandy Gravel - matrix color is grayish orange (10YR 7/4) - sub-angular to subrounded, mod. to poorly graded, max size = 6cm, some clay.

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH45-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSO
DATE:
CHECKED BY: USCS & modified DATE: 8/3/89

PROJECT NO: 667-11.22

Top/Bottom of Core in Box	Top/Bottom of Core in Feet	Sample Number	Feet of Core Recovered	Feet of Core Lost	Fractures per Foot	Fracture Angle	Bedding Angle	Glass Size Distribution	Depth in Feet	Lithologic Log	Lithologic Description
BOX 3 of 4	20.0 TO 22.5		1.3 (1)						21, 22		F.G. Sandstone - yellowish gray (5Y 7/2), massive bedding, ~~mod~~ highly weathered, mod. friable, poorly graded, ~~some silt~~, trace of iron staining.
	22.5 TO 25.0		1.7 (1)						23, 24, 25		2nd ~~1st~~ 1/2 of interval is same as above w/ more carbonaceous staining. ~~2nd~~ 1st 1/2 of interval is a claystone mottled yellowish gray (5Y 8/1) & dark yellowish orange (10 YR 6/6), massive bedding, well weathered, slightly friable, some carbonaceous staining
↑ 26.8	25.0 TO 26.8		1.35 (1)						26		Silty claystone mottled yellowish gray (5Y 8/1) & dark yellowish orange (10 YR 6/6), bedding non apparent, highly weathered, slightly to mod. friable some carbonaceous staining. F.G. sand in pockets
26.8 ↓	26.8 TO 27.5		ND						27		Same as above; no sand pockets
BOX 4 of 4	27.5 TO 30.0		ND						28, 29		Same as above; mod friable grades into a F.G. sandstone w/ colors as above, bedding non apparent mod. friable, poorly graded, trace of carbonaceous staining.

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 45-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD
DATE:
CHECKED BY: DATE: 8/3/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE RECOVERED (USCS & symbol)	FEET OF CORE LOST	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	30.0 TO 32.5		(1) 2.0						31, 32		Clayey Sandstone - mottled yellowish gray (5Y 8/1) & dk yellowish orange (10YR 6/6), bedding nonapparent, highly weathered, mod. friable, V. F.G. to F.G., poorly graded, some iron staining, trace of carbonaceous staining.
X	32.5 TO 33.9		(1) 0.2						33		Same as above; color is yellowish gray (5Y 7/2), less iron staining
BOX 4 OF 5 ↑ 37.5	33.9 TO 37.5		NO						34, 35, 36, 37		Same as above, becoming mottled again in the 2nd 1/2 of interval, w/ increased iron staining
37.5 ↓ BOX 5 OF 5 ↑ 40.0			(1) 1.7						38, 39		Same as above

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core runs cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 45-27 BR 3-59-27

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LCL
DATE: 2/4/89
CHECKED BY:
DATE:

PROJECT NO: 667-11.22

Depth in Feet	Depth in Core	Sample Number	Feet of Core	USCS Symbol	Fractures per Foot	Fracture Angle	Bedding Angle	Drain Size	Depth in Feet	Lithologic Log	LITHOLOGIC DESCRIPTION
0.0	0.0		(1) 9	GC				>50' Gravel	1		Gravel, medium light gray (N7) (N6), clay matrix is medium light gray (N6) to moderate yellowish brown (10 YR 5/4) angular to subangular, moderately well graded, 6 cm, trace of roots and some silt.
	2.0 to 4.0		0						2, 3, 4		No Sample
	4.0 to 7.0		(1) 30					>50' Clay	4, 5, 6		Clay, light gray (N7), [illegible] not apparent, highly [illegible] highly friable, [illegible] trace [illegible] carb [illegible] and silt
	7.0 to 9.5		ND					>50' Clay	7, 8, 9		As above with decrease in carbonaceous in [illegible] and increase in silt fraction.
9.5 to 2.0	9.5 to 2.0		ND					>50'			As above, [illegible]

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 45-27 BR / RH 59-27

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: [illegible]
CHECKED BY:
DATE:

USCS symbol

PROJECT NO: 667-11.22

Depth in feet	Sample number	Feet of core	Fractures per foot	Fracture angle	Bedding angle	Drilling time	Depth in feet	Lithologic log	Lithologic description
	9.5 to 12.0	ND			25°	>50° Silt	11		Silt, light gray (N7) laminar, bedding <2 mm, DCB, ~~not apparent~~, highly weathered, highly friable, localized iron staining, some clay
	12.0 to 14.5	ND				>50° clay	12, 13, 14		Interval grades to Claystone, light olive gray (5Y 6/1), bedding not apparent, highly weathered, moderately friable, localized iron staining. to 13.0 ft DCB. ~~Below~~ 12.0 ft interval to dark olive gray (5Y 4/1) with abundant iron staining and some carbonaceous mineralization
	14.5 to 17.0	ND		60° to 90°		>50° clay	15, 16		Interval grades to Siltstone at ~13.0 ft. Siltstone, [illegible] orange (10YR 7/4), bedding not apparent, highly weathered, moderately friable, local iron staining, some clay
17.0	17.0 to 19.5	ND					17, 18, 19		Interval grades to claystone at ~14.4 ft. Claystone, olive gray (5Y 3/2), bedding not apparent, highly weathered, highly friable, abundant iron staining on fracture faces. Interval grades to gray orange with depth, at 17.3 ft interval grades to olive gray (5Y 1/2)
	19.5 to [illegible]	ND							

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 45-87 CR 64 57-7

PAGE _ OF 6

DATES DRILLED:
ELEVATION:
GEOLOGIST(S):
DATE:
CHECKED BY: DATE:

PROJECT NO: 667-11.22

Depth interval	Sample interval					Angle				Depth (ft)		LITHOLOGIC DESCRIPTION
	19.5 to 22.0		ND						75% clay			As above
										21		As above with clear [illegible] to medium [illegible] and carbonaceous [illegible] beginning at ~21 ft.
	22.0 to 24.5		ND							22, 23, 24		small body (< .2 ft thick) of coal at 24 ft.
24.5	24.5 to 27.0		ND			60°				25, 26		Claystone, light olive gray (5 Y 6/1), bedding not [illegible], highly weathered, highly friable, abundant iron staining on fractures.
	27.0 to 29.5		ND							27, 28, 29		As above with increase in iron staining and fractures.
	29.5 to 31.7		ND									

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 45-87 BR/ [illegible] EH 51-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: [illegible] +10
CHECKED BY:
DATE:

USCS symbol

PROJECT NO: 667-11.22

Depth in feet	Lithologic description
27.5 to 31.7	As above, bedding appears to be horizontal based on core breakage.
31.7 to 32.0	
32.0 to 34.5	
34.5 to 37.0	
37.0 to 39.5	Siltstone and iron rich concretions, light olive gray (5 Y 6/1) and light brown (5 YR 5/6), bedding not apparent, well weathered, moderately friable. Interval grades to silty sandstone at ~ 38 ft. Silty Sandstone, grayish orange (10 YR 7/4), thin bedded, horizontal to ~5 dip on bedding, well weathered, moderately friable, very fine grained, moderately sorted. Interval grades to silty claystone.
39.5 to 42.0	

Box 5 of 8

1/9/89

1/10/89

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 45-87/159-87

BR BH

PAGE 5 OF 6

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 8/10/89
CHECKED BY:
DATE:

USCS symbol

PROJECT NO: 667-11.22

Depth in feet	Lithologic description
39.5 to 42.0	(Cont'd. from previous page) Silt, Clay, grayish orange (10 YR 7/4) to light gray (N7), well weathered, moderately friable, localized iron staining along parting and irregular mottling, bedding not apparent.
42.0 to 44.5	Clayey siltstone, mottled very light gray (N7) to medium light gray (N6), bedding not apparent, weathered, moderately friable, irregular bodies of vfg sandstone. Interval from 42.0 to 43 ft. appears to have thin, horizontal bedding based on core breakage.
44.5 to 47.0	
47.0 to 47.4	
47.4 to 49.5	
49.5 to 52.0	Interval grades to claystone at ~49.5. Claystone, olive gray

Box 6 of 8

Box 7 of 8

DCB

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BR 45-87/BH 59-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 8/10/89
CHECKED BY:
DATE:

USCS SYMBOL

PROJECT NO: 667-11.22

Top/Bottom of Core in Box	Top/Bottom of Core (in Feet)	Sample Number	Feet of Core	Fractures per Foot	Fracture Angle	Bedding Angle	Grain Size Distribution	Depth in Feet	Lithologic Log	Lithologic Description
	49.5 to 52.0		ND				>50% clay; >50% silt	51		(cont'd from previous page) (5 Y 4/1), bedding not apparent (massive?), weathered, moderately friable, iron staining on partings, slight silt fraction.
	52.0 to 54.5		ND					52, 53, 54		Siltstone, light olive gray (5 Y 6/1), bedding not apparent, weathered, moderate to highly friable, local iron staining
Box 7 of 8 ↑ 57.0	54.5 to 57.0		ND				>50% clay; >50%	55, 56		Interval grades to Claystone at ~54.6 ft. Claystone light olive gray (5 Y 6/1), bedding not apparent (massive?), weathered, slightly friable, localized iron staining. Slickensides at ~55.3 ft.
57.0 ↓ Box 8 of 8 ↑ 59.5	57.0 to 59.5		ND					57, 58, 59		Interval grades to Siltstone at ~55.5. Siltstone, light olive gray (5 Y 6/1), bedding not apparent (massive?), weathered, slightly friable, local iron staining, moderate clay fraction. Interval grades to Claystone at ~56.8 ft. Claystone, olive gray (5 Y 4/1), bedding not apparent (massive?), weathered, moderately friable, localized iron staining and carbonaceous mineralization on partings.
										Bottom of Box 8 of 8 at 59.5

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 51-87BH62-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD
DATE:
CHECKED BY:
DATE: 8/1/89
PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROCK (IN FEET)	SAMPLE NUMBER	FEET OF CORE	USCS symbol	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 TO 2.0		0.15	—					1	—	ASPhalT
	2.0 TO 4.0		(1) 0.8						2, 3		Sandy gravelly clay - grayish orange (10YR 7/4) - med plasticity some calcareous material max gravel size = 5.5cm, trace of iron staining
	4.0 TO 6.0		(1) 1.2						4, 5		Same as above
	6.0 TO 8.0		(1) 1.8						6, 7		Same as above.
	8.0 TO 10.0		0						8, 9		No Sample

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
1) Badly broken core, accurate footage measurement not possible.
2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 51-87/BH62-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD
DATE:
CHECKED BY:
DATE: 8/1/89
PROJECT NO: 667-11.22

USCS SYMBOL

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	10.0 TO 12.0		0						11		NO SAMPLE
N	12.0 TO 12.5		0						12		
12.5	12.5 TO 14.0		18.0 0.9						13		Same as below
	14.0 TO 16.0		(1) 2.8						14, 15		Silty claystone - light brownish gray (5YR 6/1), massive bedding ?, highly weathered, moderately friable, trace of iron staining to medium gray (N5)
16.0	16.0 TO 18.0		(1) 1.7						16, 17		Same as above w/ some organic material
18.0									18		BOTTOM of BOXES
									19		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 52-87

GEOLOGIST(S): DCB/GCE
DATE: 7/19/89

PROJECT NO: 6617-11.2

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 to 2.0	0.7				4.0-6.2cm 60% VCG-PG 15% FINES 25%	GW	1		Gravel, variegated coloring, dominant color med lt gray (N6), angular to subrounded, moderately graded, some clay, dusky brown (5YR 2/2).
	2.0 to 4.0	0.7				6.0-22cm 20% VCG-FG 30% FINES 50%	CL	2, 3		Silty clay, moderate orange pink, 5YR 8/4 moderate plasticity, max gravel size 6.0cm
Box 1 of 2	4.0 to 6.0	0.35					CL	4, 5		As above, max gravel size = 3.5cm.
	6.0 to 8.0	1.0				6-0 2cm 45% VCG-PG 25% FINES 30%	GM	6, 7		Silty gravel, med light gray (N6) angular to subangular, poorly graded, silt fraction reacts with HCl.
	8.0 to 10.0	0.9					GM	8, 9		As above

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

Background BX 150-200 cpm
Box 1 100 cpm
Box 2 200 cpm

This log has been re-copied to include correct graphic lithologic log. CKF

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 52-87

GEOLOGIST(S): DCB/GCE
DATE: 7/19/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 2	10.0 to 12.0	0.75					GM	11		As above (page 1) with the following exception: silt fraction doesn't react with Dilute HCl
	12.0 to 14.0	0.2					GM	13		As Above
	14.0 to 16.0	0.45				1.5-2cm 25% FINES 75%	CL	15		Gravelly clay, pale yellowish brown 10YR 6/2 low plasticity, some silt.
↑ 18.0	16.0 to 18.0	0.95				3.0-2cm 60% VCG+FG 15% FINES 25%	GC	17		Clay gravel, variegated coloring, dominant color light gray (N7), angular to subrounded, moderately well graded, some silt.
18.0 Box 2 of 2 ↓ 20.0	18.0 to 20.0	0						19		No Sample

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

BY See page 1

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 52-87

DATES DRILLED
ELEVATION
GEOLOGIST(S) DCB/GCE
DATE 7/19/89
CHECKED BY DATE

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	FEET OF CORE IN ROW	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 2										No sample
Top sample in Box (22.0)	22.0 to 24.6		1.0' (1)					22.0		See below
Bottom	24.0 to 25.0		1.0' (1)					24.0		CLAYSTONE, HEAVILY WEATHERED, MOTTLED YELLOWISH ORANGE (10 YR 6/6), ~~OR YELLOW~~ AND YELLOWISH GREY (5Y 7/2) [AS ABOVE EXCEPT LT GREY N 7]
25.0								25.0		Bottom of Box

NOTES General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

BG 150 - 200 cpm
SEE PAGE 1

LOG OF BORING NO. 52-87

DATES DRILLED
ELEVATION
GEOLOGIST(S) DCB/GCE (USCS symbol)
DATE 7/19/89
CHECKED BY DATE

PROJECT NO 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
BOX 1 of 2 0.0	0.00 to 2.00		.7'	GW			40-2 cm 60% VCG-FG 15% FINES 25%	1 2		GRAVEL, ~~SOME~~ VARIGATED COLORING, DOMINANT COLOR MED LT GRAYNG, ANGULAR to SUBROUNDED, MODERATELY GRADED, SOME CLAY, DUSKY BROWN → 5YR 2/2
↓	2.00 to 4.00		.7'	CL			6-2 cm 20% VCG-FG 30% FINES 50%	3 4		SILTY CLAY, MODERATE ORANGE PINK, 5YR 7/4 MODERATE PLASTICITY, MAX. GRAVEL SIZE 60 cm
	4.00 to 6.00		.35'	CL				5 6		AS ABOVE, MAX GRAVEL SIZE = 35 cm
	6.00 to 8.00		1.0'	GM			6-2 cm 45% VCG-FG 25% FINES 30%	7 8		SILTY GRAVEL, MED LIGHT GREY (N6) ANGULAR TO SUBANGULAR, POORLY GRADED, SILT FRACTION REACTS W/ HCL,
	8.00 to 10.00		.9'	GM				9		AS ABOVE

NOTES General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

BACKGROUND β γ 150 - 200 cpm
BOX 1 100 cpm
BOX 2 → 200 cpm

LOG OF BORING NO. 52-87

DATES DRILLED
ELEVATION
GEOLOGIST(S) BCB/GCE
DATE 7/17/89
CHECKED BY DATE

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW	SAMPLE NUMBER	FEET OF CORE IN BOX	FEET OF CORE IN RUN (USCS symbol)	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
BOX 1 of 2 10.00 to 12.00	10.00 to 12.00		.75'	GM						AS ABOVE W/ FOLLOWING EXCEPTION SILT FRACTION DOESN'T REACT W/ DILUTE HCL (PAGE 1)
							~~1.5-2cm~~ ~~25%~~ ~~FINES~~ ~~75%~~	12		
	12.00 to 14.00		.2'	GM						AS ABOVE
							1.5-2cm 25% FINES 75%	14		
	14.00 to 16.00		.45'	CL						GRAVELY CLAY, PALE YELLOWISH BROWN 10YR 6/2 LOW PLASTICITY, SOME SILT
							30-2cm 80% VCG-PG 15% FINES 25%	16		
	16.00 to 18.00		.95'	GC						CLAY GRAVEL, VARIGATED COLORING, DOMINANT LIGHT GRAY (N7), ANGULAR TO SUBROUNDED, MODERATELY WELL GRADED, SOME SILT
								18		
BOX 2 of 2										NO SAMPLE

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

BY

SEE PAGE 1

LOG OF BORING NO.

52-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB/GCE
DATE: 7/19/89
CHECKED BY:
DATE:

USCS symbol

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROCK (IN FEET)	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	GROUND ANGLE	DRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 2			X					22.0	X	No sample
Top sample in Box (22.0)	22.0 to 24.0		1.0' (1)					24.0		See below
Bottom 25.0	24.0 to 25.0		1.0' (1)					25.0		Claystone, heavily weathered, mottled yellowish orange (10 YR 6/6), and yellowish gray (5Y 7/2) [to above except LT gray N7]
										Bottom of Box

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

BG 150 - 200 cpm

SEE PAGE 1

LOG OF BORING NO. 87-52 BH

GEOLOGIST(S): [illegible]
DATE: 9/5/89

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0-2.0	(1) 0.7				55% GRAVEL 35% SAND 20% CLAY		1		CLAYEY SANDY GRAVEL, matrix color is mod brown (5 Y 3/4), subangular - subrounded, mod - well graded, max size = 5cm, some calc. material
	2.0-4.0	(1) 0.6						2, 3		CALICHE, moderate orange pink (5 YR 8/4) powdery texture, some gravel
	4.0-6.0	(1) 0.3						4, 5		Same as above increase in gravel fraction
	6.0-8.0	(1) 1.0				30% GRAVEL 70% CALICHE		6, 7		Same as above again, increase in gravel fraction, some sand, some silt, slightly more consolidated texture
	8.0-10.0	(1) 0.8				~~50% GRAVEL~~ 55% GRAVEL 45% CALC. MATERIAL		8, 9		CALCAREOUS GRAVEL, matrix color is moderate orange pink (5 YR 8/4), angular - subangular, mod graded, max size = 8 cm, some sand

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 87-52 BH

GEOLOGIST(S): [illegible]
DATE: 9/5/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 2	10.0-12.0	0.7				60% GRAVEL 25% SAND 15% CLAY	GC	11		CLAYEY, SANDY GRAVEL, matrix color is grayish orange (10 YR 7/4), angular-subangular, mod graded, max size = 6 cm, sand is FG-MG, some silt, slightly calc.
	12.0-14.0	(1) 0.2						12, 13		NO SAMPLE - JAR
	14.0-16.0	(1) 0.4				50% GRAVEL 30% SAND 20% CLAY	GC	14, 15		Same as above; increase in clay & sand fraction, max size = 3 cm
	16.0-18.0	(1) 0.9				65% GRAVEL 20% SAND 15% CLAY	GC	16, 17		Same as above. slight brown (5 YR 5/6) increase in gravel fraction,
18.0 Box 2 of 2	18.0-20.0							18, 19		NO SAMPLE

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 87-52 BH

GEOLOGIST(S): [illegible]
DATE: 9/5/89

PROJECT NO: 6667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 2	20-22.0	ϕ						21		NO SAMPLE
	22.0 -24.0					30% silt 70% clay		22, 23		SILTY CLAYSTONE, yellowish gray (5 Y 7/2), no apparent bedding, highly weathered (blocky texture at top of interval), mod friable, some iron stain as mottling, trace of gravel at top of interval.
↑ 25.0	24.0 -25.0					15% silt 70% clay		24, 25		Same as above - less silt fraction
End of Boxes								26, 27, 28, 29		

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 52-87/BH63

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TBD
DATE:
CHECKED BY:
DATE: 8/1/89

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (FT/ACTUAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (ACTUAL)	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 TO 2.0		1.4 (1)	CL					1		Silty clay - Dark yellowish brown (10YR 4/2) - est. med. plasticity some sand, trace of gravel (max size ≈ 4.5cm), trace of roots, & calcarious material
	2.0 TO 4.0		1.7 (1)	CL					2, 3		grades to a f.g. sandy clay grayish orange (10YR 7/4) some iron staining, trace of calcite & f.g. gravel
	4.0 TO 6.0		2.25 (1)	CL					4, 5		Same as above w/ increased calcite
BOX 1 of 3 ↑ 8.0	6.0 TO 8.0		ND	CL					6, 7		Same as above w/ increased sand fraction & sand s fg to m.g. & less calcite
8.0 ↓ BOX 2 of 3	8.0 TO 10.0		ND	CL					8, 9		Silty clay - grayish orange (10YR 7/4), est mod. high plasticity, some f.g. to m.g. sand & iron staining as mottles, trace of gravel (max size ≈ 2.5cm)

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 52-87/BH-63

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSO
DATE:
CHECKED BY:
DATE: 8/1/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (IN FEET)	SAMPLE NUMBER	FEET OF CORE	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	10.0 TO 12.0		ND	CL					11		F.G. TO M.G. sandy clay grayish orange (10YR 7/4) est. plast. = med., some iron staining as mottles, some silt, trace of gravel (max size = 4 cm).
	12.0 TO 14.0		(1) 1.2	GW				>50% >2mm	12, 13		Gravel - predominantly very light gray (N8), angular to subrounded, modly well graded, max size ≈ 6cm, some sand, trace of clay.
Box 2 of 3	14.0 TO 16.0		(1) 1.35	GC				>50% V.C.G & greater	14, 15		Sandy Gravel - predominantly med lt gray (N6) - angular to subrounded, well graded, max size ≈ 6cm, Some clay, trace of silt.
↑ 17.0	16.0 TO 17.0		ND	GC				>50% V.C.G & greater	16		Same as above
17.0 ↓	17.0 TO 17.5		0.8					>50% >VCG	17		Sandy Clayey Gravel - grayish orange (10YR 7/4) (clay matrix) rounded to subrounded, poorly graded, max size = 5 cm.
	?		?	?				?			
Box 3 of 3	18.0 TO 20.0		0 ~~0.8~~ LSD						18, 19		NO Sample

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 52-87/BH63

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSO
DATE:
CHECKED BY:
DATE: 8/1/89

USCS SYMBOL

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX	FEET OF CORE IN ROW	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	20.0 TO 22.0		0						21		NO SAMPLE
	22.0 TO 23.0		0						22		
	23.0 TO 24.0		0						23		
M)	24.0 TO 24.5	Sample in Jar							24		
BOX M	24.5 TO 26.0		12 (1)	CL					25		Silty Clay - light Brownish gray (5YR 6/1) to medium gray (N5), est. med plast, some organic matter, trace of iron staining
↑ (SP)	26.0 TO 28.0		ND	CL					26		Same as above
									27		
									28		Bottom of boxes
									29		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 53-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCR
DATE: 5/11/94
CHECKED BY:
DATE:

USCS SYMBOL

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN ROW (INTERVAL)	FEET OF CORE IN ROW	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 to 2.0		(1) 1.6	CL				>50 clay	1, 2		Gravel, Clay, moderate yellowish brown (10 YR 5/4), moderate plasticity, trace of roots in upper 2 ft. localized carbonate mineralization
	2.0 to 4.0		(1) .8						3, 4		
	4.0 to 6.0		(1) 1.3	GC				>50 gravel, >50 clay	5, 6		Clayey Gravel, clay matrix is grayish brown, (5 YR 3/4) to dark reddish brown (10 R 3/4), gravel is very light gray (N8) angular, poorly graded, max. size 6.5 cm, localized carbonate mineralization
	6.0 to 8.0		(1)	CL				>50 clay	7, 8		Clay, moderate yellowish brown (10 YR 5/4), moderate plasticity, some gravel & silt, localized carbonate mineralization
	8.0 to 10.0		(1)						9		Clay, light gray (N7), high plasticity, localized carbonate mineralization.

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 53-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 3/1 87
CHECKED BY:
DATE:

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX	USCS SYMBOL	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 1 10	10.0 to 11.0		ND	CL					>50% clay	11		As above with localized iron stains and carbonaceous mineralization.
11.0	11.0 to 12.0		ND							12		
Box 2 of 2 14.0	12.0 to 14.0		ND							13		
										14		Bottom of Box 2 of 2 at 14.0 ft.

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 53-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): UAA
DATE:
CHECKED BY:
DATE: 8/1/89

USCS symbol

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FT. (IN FT/FT)	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 – 2.0		.4(1)	GW				Gravel >50%	1		Gravel Med Lt gray (N/5). Angular to sub-angular moderately sorted some enclosed in calcite mineralization. Max size 6 cm Some silty clay calcite present
	2.0 – 4.0		.8(1)	GC				Gravel >50%	2, 3		Gravel Med. Lt gray (N/5) Angular to sub-rounded moderately sorted. Max size 6cm Silty clay matrix dark yellowish brown (10yr 4/2) Some sand. Calcitic
	4.0 – 6.0		.9(1)	GC				Gravel >50%	4, 5		Gravel Med Lt. gray (N5) predominantly. Angular to subrounded - well graded Max. size 4 cm Matrix caliche & sandy clay. Grayish orange (10yr 7/4) to white.
	6.0 – 8.0		.5(1)	GC					6, 7		Same as above
	8.0 – 10.0		.9(1)	GC					8, 9		Same as above

Box 1 of 3

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH53-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): UAA
DATE:
CHECKED BY: DATE:

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET (INTERVAL)	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION	
Box 1 of 3	10 0 to		1.7(1)	GC					11		Gravel, as above	
13 0	11.6 to 13 0		1.3	GC				Gravel 50% Clay + sand 50%	12		Clayey Gravel Med lt gray (N6) Angular to subangular moderately well graded max size 6cm. matrix grayish orange (10yr 7/4) Clay some sand	Overlap of boxes as labeled by markers in box
Box 2 of 3	13 2 to 16 2		1.3 ~~1.3~~	GC					13		Same as above	Begin Box 2
	16 2 to 17.9		1.7 ~~1.3~~	CL				Clay >50%	16		Sandy silty clay lt brown (5yr 5/6) Low plasticity Sand fine to very fine grained Trace gravel	
	17 9								18		No Sample	
	18 2 18.6		1.6	CL							Same as above, more gravel, 2 5cm	
	18 6 to 20 6		1.0	GC				Gravel >50%	19		Clayey gravel subangular to sub-rounded med lt. gray (N6). Poorly graded max size 6 5cm Clay as above	

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

Intervals from 18 2 to 20 6 Not marked properly

LOG OF BORING NO. BH 53-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): UAA
DATE:
CHECKED BY: DATE: 8/2/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION	
											See previous page.	
20.6	20.6											
20.6 ↓ Box 3 of 3	20.6 to 22.6		1.6 (1)	CL & UA				CL >50%	21, 22		Gravelly Clay, Yellowish gray (5y 8/1). High plasticity. Gravel is subangular to subrounded mod wellgraded max size. 5cm some sand also occurs in matrix	Begin Box
	22.6 to 24.0		1.5 (1)	CL				clay >50%	23		Clay Yellowish gray (5y 8/1) mod-high plasticity some iron staining throughout matrix	
↑ 24.0	24.0								24		Bottom of Boxes	
									25, 26, 27, 28, 29			

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 54-87

PAGE 1 OF 1

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 8/2/89
CHECKED BY:
DATE:

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE	USCS SYMBOL	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 to 2.0		ND	CL					75% clay	1, 2		Gravelly Clay, moderate yellowish brown (10 YR 5/4) to medium light gray (N6), high plasticity, some caliche in interval from 0.0 to 0.5 ft., some root fragments, gravel fraction is absent below 0.8 ft.
	2.0 to 4.0		ND							3, 4		Clay, dark yellowish brown (10 YR 4/2), high plasticity, trace of plant debris at 2.1 ft., clay color grades to grayish orange (10 YR 7/4) and a silt component becomes apparent at ~4 ft., locally calcareous.
	4.0 to 6.0		ND							5		
	6.0 to 8.0		ND							6, 7		Clay stone, medium light gray (N6), bedding not apparent, contact with regolithic gradational, highly weathered, moderately friable, localized iron staining and carbonaceous mineralization.
8.0	8.0 to 10.0		ND							8, 9		Bottom of Box 2/2 at 10.0 FT

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH54-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD/DMT
DATE:
CHECKED BY: DATE: 8/7/89
PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE RECOVERED	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BORING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓ BOX 1 OF 4 ↑ 6.0	0.0 TO 2.0		(1) 1.6	CL					1		TOP 3" SILTY CLAY, MOD BROWN (5 YR 3/4), EST LOW PLAST, SOME ROOTS, SOME GRAVEL. BOTTOM OF INTERVAL - CALCHE, ~~W/ SOME~~ WAS GREYISH ORANGE PINK (10 R 8/2), TRACE OF GRAVEL, MAX GRAVEL SIZE = 8 CM
	2.0 TO 4.0		(1) 1.45						2 3		SAME AS ABOVE WITH INCREASING GRAVEL
	4.0 TO 6.0		(1) ~~1.85~~ WAS ND						4 5		SAME AS ABOVE W/ LARGER PORTION OF GRAVEL IN TOP 8".
6.0 ↓ BOX 2 OF 4	6.0 -8.0		(1) 0.8	GC					6 7		CALCAREOUS GRAVEL - MATRIX COLOR GREYISH ORANGE PINK (10 R 8/2) ANGULAR - SUB ANGULAR, MOD-WELL GRADED, MAX SIZE IS 5.5 CM, SOME SAND
	8.0-10.0		(1) .65	GC					8 9		CALCAREOUS SANDY GRAVEL - MATRIX COLOR VERY PALE ORANGE (10 Y 8/2) ANGULAR / SUB-ANGULAR, MOD-WELL GRADED, MAX SIZE = 5.0 CM, SOME CLAY, TRACE OF SILT

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 54-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD/DAT
DATE:
CHECKED BY: DATE: 8/7/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE RECOVERED	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTINCTIONS	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 4	10-12.2		0.3 ~~1.45~~ NM	GC					11, 12		CALCAREOUS SANDY GRAVEL - MATRIX COLOR - GREYISH ORANGE (10 YR 7/4) SUB ANGULAR - ANGULAR, POOR - MOD GRADING, MAX SIZE = 4 cm, SOME CLAY
	12.		~~0.8~~ ~~1.45~~ 1.05 NM	GC					13, 14		SANDY CLAYEY GRAVEL - MATRIX COLOR GREYISH ORANGE (10 YR 7/4), SUB-ANGULAR - ANGULAR, MOD-WELL GRADED, MAX SIZE = 6 cm, SOME CALCAREOUS MATERIAL
	14.2-15.5		(1) 0.8	GC					15		SAME AS ABOVE - MAX SIZE = 3 cm.
	15.5-17.4		∅	—					16, 17		SAME AS ABOVE - SUB-ANGULAR - SUB ROUNDED, MAX SIZE = 8 cm ← NO SAMPLE
	17.4-19.4		(1) 1.2	GC					18, 19		CLAYEY SAND / SANDY CLAY, LIGHT BROWN (5 YR 5/6), MOD GRADING, CG - VFG, ~~EST MOD PLAST~~ MED PLASTICITY, TRACE OF GRAVEL
	19.4-21.5		(2) 1.35	SC/CL							

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 54-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD/DAT
DATE:
CHECKED BY:
DATE: 8/7/89
PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 4									21		See Previous Page
Box 3 of 4	21.5 -23.5		(1) 0.9	GC					22, 23		Clayey Sand / Sandy Clay, Light Brown (5 YR 5/6), Mod Grading VCG-V.FG, Med Plast, Trace of Gravel
	23.5-25.5		(1) 0.85	GC					24, 25		Same as Above
	25.5 -27.5		(1) 1.5	GC					26, 27		Same as Above - Greyish Orange (10 YR 7/4)
	27.5 -29.5		(1) .95						28, 29		Same as Above - Some Gravel
	29.5 -31.5		∅								

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 54-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD/DAT
DATE:
CHECKED BY:
DATE: 8/7/89
PROJECT NO: 667-11.22

USCS symbol

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
		Ø	Ø						31		NO SAMPLE
Box 3 of 4	31.5 -34.4		(1) .8						32, 33, 34		CLAYEY SAND/SANDY CLAYEY - GREYISH ORANGE (10 YR 7/4), MOD GRADING, VCG-VFG, MED PLAST, TRACE OF GRAVEL
	34.4 -36.4		(1) .6						35, 36		SAME AS ABOVE - SOME GRAVEL
Box 4 of 4	36.4 -38.5		(1) .65						37, 38		SAME AS ABOVE - TRACE OF GRAVEL
	38.5 -40.5		Ø						39		SAMPLE JARS

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 54-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD/DAT
DATE:
CHECKED BY:
DATE: 8/7/89
PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN BOX (IN FEET)	SAMPLE NUMBER	FEET OF CORE (IN FEET)	~~FEET OF CORE IN BOX~~ USCS symbol	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 4 of 4	40.5 - 42.5							41		SAMPLE JARS
								42		
	42.5 - 44.5							43		SAMPLE JARS
								44		
END OF BOXES								45		
								46		
								47		
								48		
								49		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 55-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD
DATE:
CHECKED BY:
DATE: 8/1/89
PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROCK (VERTICAL)	SAMPLE NUMBER	FEET OF CORE	USCS symbol	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 TO 2.0		ND	CL					1		Silty Clay - grayish brown (5YR 3/2), med. plast, some m.g. to v.c.g. sand, some roots, trace of gravel, max gravel size = 5 cm
	2.0 TO 2.8		0.5 (1)	CL					2		sandy clay - dark yellowish brown (10 YR 4/2) - low to med plast., some gravel trace of roots, max gravel size = 6.5 mm
	2.8 TO 4.0		0	–					3		NO SAMPLE
Box 1 of 2	4.0 TO 5.5		1.8 (1)	SC					4		Clayey m.g. to v.c.g. sand dark yellowish brown (10 YR 4/2) subround to rounded, poorly graded, some gravel
	5.5 TO 7.0		ND	–					6		Clay stone - light olive gray (5Y 6/1) massively bedded, ~~highly~~ ok weathered, mod friable, Trace of iron staining, carbonaceous material, + calcite,
	7.0 TO 9.5		1.1 (1)	–					7 8 9		Same as above
↑ 9.5											
9.5 ↓											

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 55-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSP
DATE:
CHECKED BY:
DATE: 8/1/89
PROJECT NO: 667-11.22

USCS symbol

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE (INCHES)	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
→ BOX 2 of 12.1	9.8 TO 12.1		2.6 (2)	—					11		claystone - grayish orange (10 YR 7/4) grading to pale yellowish brown (10 YR 6/2), trace of iron staining in fractures & as mottles, trace of carbonaceous material, & trace of calcite in pockets.
									12		BOTTOM OF BOXES
									13		
									14		
									15		
									16		
									17		
									18		
									19		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 55-87

PAGE 1 OF 1

GEOLOGIST(S): DCB
DATE: 8/29/89

PROJECT NO: 667-11-22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 to 1.9	ND				>50% clay	CL	1		Clay, moderate brown (5 YR 3/4), moderate plasticity, some silt, some root fragments, trace of gravel.
	1.9 to 3.7	ND				>50% clay		2, 3		Clay, pale yellowish brown (10 YR 6/2), moderately high plasticity, some silt, calcareous with small bodies of caliche precip., local iron staining, trace of root fragments.
1 of 2	3.7 to 6.6	ND						4, 5, 6		Claystone, pale yellowish brown (10 YR 6/2), bedding not apparent, highly weathered, slightly friable, slight silt fraction, local iron staining, calcareous. Increase in iron staining from ≈5.0 to 5.5 ft. and a small iron nodule occurs at ≈ 5.5 ft.
Bot	6.6 to 9.3	(2) 1.9						7, 8, 9		Claystone, light gray (N7), bedding not apparent, well weathered, slightly friable, iron staining locally and on fractures
↑ 9.3	9.3									Bottom of Box 1 of 2 at 9.3 ft.

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible.

Box 2 of 2, 55-87 is not in trailer, not accounted for.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH 55-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY: DATE: 8/2/89

USCS Symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BH	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE RECOVERED	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0 0	0.0 to 1.4		.7(1)	GC				Gravel >50% Clay ≈40%	1		Silty clayey gravel Dark gray (N3) and to grayish pink (5R 8/2) Sub angular to Subrounded well graded. Max size 5cm Matrix Silty sandy clay Very dusky red (10R 2/2) Sand fine to coarse grained. Some Calcite in matrix + on gravel
	1.4 to 2.0		0						2		No Sample
	2.0 to 3.3		.4(1)	GC				Gravel 50%	3		Silty clayey gravel Gravel mod lt gray (N6) Angular to Subangular Mod well graded Max. size 4cm Matrix lt brown (5yr 5/6). Sandy clay. Sand fine to very coarse grained. Calcite present in matrix + in rinds on gravel.
	3.3 4.0		0						4		No Sample
	4.0 to 5.5		.9(1)	GC				Gravel 50%	5		Same as above. Max size gravel 60 cm.
	5.5 to 7.0		0						6 7		No Sample
	7.0 to 9.5		0						8 9		
	9.5 to 10.4		.5(1)	GP				Gravel 100%			3 (a cobble) Dark gray (N3). Subrounded poorly graded. Avg. size 6cm. Calcite clay rind

Box 1 of 4

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 55-87 BH

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:
DATE: 8/2/89

PROJECT NO: 667-11.22

USCS SYMBOL

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	FEET OF CORE IN ROW	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 4	9.5 to 10.9		~~1.4(1)~~ .5(1)								See description on previous page
	10.9 to 14.0		~~1.4(1)~~ 1.1(1) ut					Sand 60% 70% Gravel 20% Clay 10%	11, 12, 13		Clayey gravelly sand Lite brown (5yr 5/6) Sub angular to sub rounded Mod well graded V.f. grained to coarse grained. Gravel subangular max. size 3.5 cm well graded Clay content enough to produce low plast
	14.0 to 14.5		25(1)					silt 40 Sand 30 Gravel 30	14		Sandy gravelly silt. ~~Silty sandy gravel~~ Grayish orange (10yr 7/4). Angular to subangular sand + gravel well graded Max size 1.5 cm. Enough clay to produce low plasticity.
	14.5 to 17.0		2.0(1)					Gravel 50% Matrix 50%	15, 16		Clayey gravel Gravelly predominantly Med Lt. gray. Angular to subrounded. Mod ~~well~~ graded Max size 5cm Clay matrix Lt brown (5yr 5/6) Sandy
17.0	17.0 to 17.7		.75(1)					Clay 80% Sand + gravel 20%	17		Sandy gravelly clay. Mod reddish brown (10R 4/6) Mod. plasticity. Gravel Rounded. Max size 4 cm Sand fine to coarse grained. Some black carbonaceous miner-
17.7	17.7 to 19.5		1.6(1)					Clay 80% 60% Sand + gravel 20% 40%	18, 19		Same as above More gravel.
Box 2 of 4	19.5		1.5(1)								See next page

Begin Box 2 ↓

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 55-87 BH

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): (AA)
DATE:
CHECKED BY: USCS Symbol DATE: 8/21/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN BORING	SAMPLE NUMBER	FEET OF CORE RECOVERED	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	21.6		1.5(1)	GC				Gravel >50%	21		Clayey gravel Light gray (N7) gravel Sub angular to subrounded. Mod well graded. Max size 6cm Clay matrix dark yellowish orange (10yr 6/6) Sandy fine to coarse grained
	23.5		.85(1)	GC					22, 23		Same as above
	24.5		O						24		No sample
	25.5		.5(1)	GC				Gravel >50%	25		Same as above
	25.5 to 25.7		25(1)	CL				Clay >50%			
	25.7 to 27.0		O						26, 27		No sample
	28.9		1.1(1)	GC				Gravel >50%	28		Sandy Clay Grayish orange (10yr 7/4). Moderate plasticity. Sand fine to coarse grained Some gravel. up to 1cm
	29.2		.3(1)	GC					29		Clayey gravel Grayish orange (10yr 7/4) matrix Lite gray (N7) gravel Sub angular to subrounded Mod well graded Max size 6cm Matrix sandy fine to coarse grained
	29.5		O								No Sample
	30.4		1.0(1)	CL				Clay >80%			Silty clay yellowish gray (5Y 8/1). Some Pale yellowish orange (10yr 8/6) and Light Brown (5yr 5/6) Trace gravel mod. high plasticity

Box 2 of 4

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 55-87-8H

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:
DATE: 8/2/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE RECOVERED (Percent Recovery)	USCS Symbol	FRACTURES PER FOOT	FRACTURE ANGLE	BORING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION	
30.4	30.4		1.0(1)								See above description	
30.4 ← Box 3 of 4			1.75(1)	CL				Clay >70%	31		Silty clay yellowish gray (5y 8/1) Trace dk. yellowish orange (10yr 6/6) Mod. high plasticity Some gravel ~~to 1cm~~ 6.5cm	Begin Box 3
	32.0								32		Same as above. Less gravel	
			.4(1)	CL					33			
	34.1								34			
	34.5										No Sample	
			2.8(1)	CL				Clay >70%	35		Same as above, more dk. yellowish orange (10yr 6/6).	
↑ 36.6	36.6								36			
36.6 ← Box 4 of 4									37		No Sample	Begin Box 4
	37.0							Clay >90%			Claystone, Lt. olive gray (5y 6/1) to grayish orange (10yr 7/4.) Bedding not apparent Extremely weathered Moderately friable	
	38.45								38			
39.5								Clay >90%	39		Claystone, Same as above Less weathered Slightly friable	
											End of Boxes	

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 56-87 / SP16-87

GEOLOGIST(S): DCB
DATE: 7/20/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 to 2.0	(1) 1.5				>50% CG-FG Sand; >50% Gravel 5.5cm to 2mm	SP; GP	1, 2		Gravelly Sand, light olive gray (5Y 6/1), angular to subrounded, well graded, some silt. At approximately 1ft. this interval grades to a Clayey Gravel, very light gray (N8), subangular to subrounded, poorly graded. Clay fraction is dark reddish brown (10 R 3/4).
	2.0 to 3.5	(1) 1.7				>50% Gravel 5.5cm to 2mm	GP	3		Sandy Gravel, very light gray (N8), subangular to subrounded, poorly graded, some silt, and a trace of clay.
Box 1 of 2	3.5 to 4.0	0						4		No Sample
	4.0 to 6.0	(1) 1.85				>50% Gravel 6cm to 2mm	GW	5, 6		Clayey Gravel, light gray (N7), subangular to rounded, moderately graded, some sand and silt. Clay fraction is dark yellowish brown, (10 YR 4/2). At 4.1 ft (est) this interval grades to a Sandy Gravel light gray (N7) angular to subrounded, moderately graded within caliche mineralization. Caliche + sand are white (N9)
	6.0 to 8.0	(1) 1.5					GW	7, 8		As above, as given for interval below 4.1 feet.
	8.0 to 10.0	0						9		No sample

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

This log has been re-copied to include correct graphic lithologic log. CKF

ROCKY FLATS PLANT

FIGURE NO.

5 & Background 50-150 cpm
Box 1 50-150 cpm

LOG OF BORING NO. 5687/SP1687 PAGE 2 OF 2

GEOLOGIST(S): DCB
DATE: 7/20/89

PROJECT NO: 6067-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
10.2 Box 1 of 2 11.2	10.2 to 11.2	(1) 1.65				75% Clay	CL	11		Silty clay, mottled, light gray (N7) to dark yellowish orange (10 YR 6/6), moderate plasticity, caliche occurs in localized bodies throughout this interval, notably in its upper 0.3 ft; black carbonaceous mineralization is disseminated throughout.
11.2 Box 2 of 2 13.4	11.2 to 13.4	(1) 1.75				75% Clay	CL	12 13		As above, less caliche occurs in this interval.
								14		Bottom of Box 2 @ 13.4

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

Bg Background 50-150 cpm
Box 2 < 50 cpm

LOG OF BORING NO. 56-87/SP 16-87

~~DATES DRILLED~~
~~ELEVATION~~
GEOLOGIST(S) DCB
DATE 7/20/89
CHECKED BY
DATE

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (interval)	SAMPLE NUMBER	FEET OF CORE IN BOX (interval)	USCS symbol ~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	DCB ~~(1)~~ ~~1.5~~ 0.0 to 2.0		(1) 1.5	SP / GP			>50' CG to FG Sand; >50' Grav. 5 cm to 2 mm	1		Gravelly Sand, light olive gray (5Y 6/1), angular to subrounded, well graded, some silt. At approximately 1 ft this interval grades to a Clayey Gravel, very light gray (N8), ~~clay~~ subangular to subrounded, poorly graded. Clay fraction is dark reddish brown (10 YR 3/4).
Box 1 of 2	DCB ~~(1)~~ ~~1.7~~ 2.0 to 3.5		(1) 1.7	GP			>50' Grav 5 cm to 2 mm	2, 3		Sandy Gravel, very light gray (N8), subangular to subrounded, poorly graded, some silt, and a trace of clay.
	DCB ~~3.5~~ 3.5 to 4.0		0					4		No Sample
	DCB ~~(1)~~ ~~1.85~~ 4.0 to 6.0		(1) 1.85	GW			>50' Grav 6 cm to 2 mm	5		Clayey Gravel, light gray (N7), subangular to rounded, moderately graded, some sand and silt. Clay fraction is dark yellowish brown, (10 YR 4/2) At 4.1 ft (est) this interval grades to a Sandy Gravel, light gray (N7) angular to subrounded, moderately graded with caliche mineralization. Caliche and sand are white (N9)
	DCB ~~1.5~~ 6.0 to 8.0		(1) 1.5	GW				6, 7		As above, DCB as given for interval below 4.1 feet
	DCB ~~0~~ 8.0 to 10.0		0					8, 9		No sample

NOTES General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

Bx Background 50-150 cpm
Box 1 50-150 cpm

LOG OF BORING NO. 56-87 / SP 16-87

~~DATES DRILLED~~
~~ELEVATION~~
GEOLOGIST(S) DCB
DATE 7/20/89
CHECKED BY. DATE

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	USCS SYMBOL ~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
10.2 Box 1 of 2 11.2	10.2 to 11.2		(1) 1.65	CL				>50' Clay	11		Silty Clay, mottled, light gray (N7) to dark yellowish orange (10 YR 6/6), moderate plasticity, caliche occurs in localized bodies throughout this interval notably in its upper 3 ft, black carbonaceous [illegible]
11.2 Box 2 of 2 13.4	11.2 ~~1.75~~ to 13.4		(1) 1.75	CL				>50' Clay	12, 13		As above, less caliche occurs in this interval.
									14, 15, 16, 17, 18, 19		Bottom of Box 2 @ 13.4

NOTES General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

B8 Background - 50-150 cpm
Box 2 <50 cpm
~~Box 2~~

LOG OF BORING NO. Bh 56-87

PAGE 1 OF

DATES DRILLED
ELEVATION
GEOLOGIST(S) LMA/TSD
DATE
CHECKED BY.

USCS symbol

DATE. 7/24/87

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 TO 1.9		(1) 1.05	GC					1		clayey gravel predominantly medium light gray (N6) subangular to angular, well graded, max size is 7cm clay fraction is grayish brown (5YR 3/2), some sand, trace of roots, trace of silt.
	1.9 TO 2.0		0						2		NO SAMPLE
	2.0 TO 3.5		(1) 0.6	GW			750% Gravel		3		Gravel & calcarious sand predominantly medium dark gray (N4), moderately ~~well~~ graded, angular to subrounded max size is 6cm, some clay
	3.5 TO 4.0		0						4		No Sample
	4.0 TO 5.5		(1) 0.1	GW			750% Gravel		5		Gravel medium dark gray (N4) subrounded, trace of clay, sand, & calcarious mineralization
	5.5 TO 7.0		0						6		No Sample
	7.0 TO 8.3		(1) 0.7	GC			50% Gravel		7 8		Clayey Sandy Gravel predominantly medium dark gray (N4), angular to subangular, moderately well graded, some silt, clay & silt fraction is moderate yellowish brown.
	8.3 TO 12.0		0						9		No Sample

Box 1 of 2

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

00 Background
Cr Box 1- 100-150

LOG OF BORING NO. Bh 56-87

DATES DRILLED
ELEVATION
GEOLOGIST(S) LAA/TSD
DATE
CHECKED BY.
DATE 7/24/89

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (interval)	SAMPLE NUMBER	FEET OF CORE IN BOX (interval)	USCS symbol ~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	8.3 TO 12		0					11		No Sample
	12.0 TO 13.4		0.7 (1)	GW				12, 13		Sandy Gravel predominantly Brownish gray (5YR 4/1), angular to subrounded, moderately well graded, some clay (moderate yellowish brown (10YR 5/4)) with an increased clay fraction from 13.4 to 14.0 ft.
	13.4 TO 14.0		0.8	GW						
	14.0 TO 14.5		0					14		
BOX 1 of 2	14.5 TO 16.0		1.8	GW				15, 16		Same as above
	16.0 TO 17.0		0					17		No Sample
↑ 18.9	17.0 TO 18.9		1.0 (1)	GW				18		Same as Above
								19		No Sample
19.0 ↓	See		Next		Page					See Next Page

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

βγ-Box 3= 50 to 150cpm

LOG OF BORING NO. BH 56-87

DATES DRILLED
ELEVATION
GEOLOGIST(S) LAA/TSD
DATE
CHECKED BY.
DATE 7/24/89

USCS symbol

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (interval)	SAMPLE NUMBER	FEET OF CORE IN BOX (interval)	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
19.0 ↓ Box 3 of 3	19.0 TO 22.0		1.6 (1)	ML					21		Clayey siltstone pinkish gray (SYR 8/1) Nonevident bedding massive slightly to moderately friable trace of iron staining
									22		Same as above with slight color change to light olive gray (5Y 6/1)
↑ 24.3	22.0 TO 24.3		1.5 (1)	ML					23		
									24		
									25		Bottom of Boxes
									26		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

BH - BOX 2 = 50 to 150 CPM

LOG OF BORING NO. 58-87

GEOLOGIST(S): LAA
DATE: 8/11/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0 0	0 0	.8				Gravel >50%	GC	1		Clayey gravel Gravel predominantly very pale orange (10yr 8/2) Angular to sub rounded Mod grading Max size 6.5 cm. Matrix sandy clay. Est plast low fine to coarse sand At very top of interval - Surfacial roots + grass in ≈ 3 in of dk yellowish brown silty clay
	2.0							2		
		0						3		No Sample
	3.5									
	4.0	LA .7 ~~.8~~				Clay ~~>50%~~	CL	4		Gravelly silty clay Grayish brown 5yr (4/2) Low to mod plasticity Gravel ranges from granule size to 2.5 cm Angular to sub rounded Mod to well sorted. ~~No Co~~ LAA Not consolidated.
		.8 LA ~~.75~~				Clay >50%	CL	5		Same as above Max size of gravel 6 cm.
								6		
	7.0							7		
		.25				Gravel 100%	G	8		One lg piece of gravel Mod gray (N5) Sub angular - 7 cm
								9		
	9.5									
										No Sample

Box 1 of 2

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 58-87

GEOLOGIST(S): LAA
DATE: 8/11/89

PROJECT NO: 6067-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 2	~~0.0~~ 12.0	.8						* 11, 12		No Sample
	12.0 – 14.5	.5				Clay >50%	CL	12, 13, 14		Gravelly Silty Clay Grayish orange (10yr 7/4) Plast low to mod Gravel granules to 2cm Angular to subangular Some sand, fine to v c.g
	14.5 – 17.0	.7				Gravel >50%	GC	15, 16, 17		Clayey gravel Gravel predominantly med dk gray (N3). Angular to subangular Granule size to 55 cm Mod to well sorted Clay matrix grayish orange (10yr 7/4) Sandy fine to v c g sand
	17.0 – 19.5	1.0				Gravel >50%	GC	18, 19		Clayey gravel. Same as above

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

* Had to erase to correct depth in feet.

LOG OF BORING NO. 58-87

GEOLOGIST(S): UAA
DATE: 8/11/89

PROJECT NO: 6607-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 2	19.5 to 22.0	1.35 (1)				Clay 75%	CL	21, 22		Gravelly clay Lt brown (5yr 6/4) Est plast. low to moderate Gravel angular to 3.5 cm. Poorly graded Clay is sandy vf.g. to coarse. Grades to silty clay. Lt. brown to very pale orange (5yr 5/6 to 10yr 8/2) Est plast low to mod Sand vf.g. to coarse. Some sm gravel Some packets of clean silt
	22.0 – 24.5	.5				Clay 75%	CL	23, 24		Silty clay yellowish gray (5y 8/1) Est plast moderate to high Trace carb. material
	24.5 – 27.0	0						25, 26, 27		No Sample
	27.5	0								
	29.5	Lt ~~1.55~~ (1) ~~1.10~~ 2.0				Clay 75%	CL	28, 29		Silty Clay Yellowish gray (5y 8/1) and dk yellowish orange (10yr 6/6) mottled. Est plasticity moderate Trace carb material ~~Yellowish~~ Lt

Begin Box 2

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO.

GEOLOGIST(S): UAA
DATE: 8/11/89

PROJECT NO: 6667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 2	295 to 320	3.2 (1)				Clay ≥50%	CL	31		Silty Clay/claystone. Yellowish gray (5y 8/1) with some dk yellowish orange (10yr 6/6) Est Plast moderate LF stone, highly weathered moderately friable. Some iron staining Trace Carb. material
320	320							32		Bottom of Boxes

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 59-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY: DATE: 8/1/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0		1.25(1)	CL				Clay >50%	1		Sandy Gravelly Clay Pale yellowish brown (10yr 6/2), low to mod. plasticity. Gravel angular to subrounded well graded Sand fine to granule size Some silt Some surficial root material Some carbonaceous material Slightly calcitic
	1.7		0						2		No sample
	2.0		1.3(1)	CL				Clay >50%	3		Same as above Gravel more rounded max size 5 cm Chunck of blue styrafoam present. 5cm long Some fibrous wood at bottom of interval - 6.5 cm long slightly calcitic.
	3.1		0						4		No Sample
	4.0		.3					100% wood			Fibrous wood only. 8cm long
	4.4		0						5, 6, 7, 8		No Sample
	8.0		1.3(1)	CL				Clay >50% Gravel ≈30%	9		Top 1/3 of interval Fibrous wood. Sandy gravelly clay last 2/3 of interval Grayish brown (5yr 3/2), low to mod plasticity. Gravel angular to subangular Mod grading Sand fine to very fine Some silt Some root material Some fibrous wood slightly calcitic max size 3cm
	9.3		0								No Sample

Box 1 of

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 59-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): UFA
DATE:
CHECKED BY: DATE: 8/1/89

PROJECT NO: 667-11.22

Box	TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE (in feet)	SAMPLE NUMBER	FEET OF CORE RECOVERED (in feet)	USCS Symbol	FEET OF CORE LOST	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION	
Box 1 of 2				0									No Sample	
	10.5 to 11.8			1.5	CL					Clay >50%	11		Sandy, gravelly Clay Grayish brown 5yr 3/2. Low to mod plast. Gravel angular to rounded. Mod grading max size 7.5cm Sand fine to very fine Some silt Trace root material Calcitic	
	11.8 to 12.8			0							12		No Sample	
	12.8 to 13.9			2.9	GC					gravel >50%	13		Sandy clayey gravel Predominant color med lt gray (N6) Angular to subrounded well graded max size 5cm matrix mod yellowish brown (10yr 5/4) Sand fine to coarse grained	
	13.9 to 15.3			0							14, 15		No Sample	
15.3 ↓	15.3 to 17.4			1.7 (1)	GC					gravel >50%	16, 17		Same as above	Begin Box 2 ↓
	17.8												No Sample	
Box 2 of 2	to 19.6			1.7 (1)	GC					Clay & sand >50%	18, 19		Same as above. Less gravel, more matrix.	
													No Sample	

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 59-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): LAA
DATE:
CHECKED BY:
DATE: 8/1/89
PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (IN FEET)	SAMPLE NUMBER	FEET OF CORE	USCS SYMBOL	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	20.5		0							~~Cle~~ No sample
	20.5		2.7(1)	CL				21		Clay Pale yellowish orange to Dark yellowish orange to pinkish gray. (10yr 8/6 to 10yr 6/6 to 5yr 8/1) High plasticity
								22		
Box 2 of 2	23.0							23		
	23.0		2.8(1)	CL				24		Same as above
								25		
26.0	26.0							26		Bottom of Boxes
								27		
								28		
								29		

Bottom

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 60-87

GEOLOGIST(S): DCB/TSD
DATE: 7/14/89

PROJECT NO: 667-11-2

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 to 2.5	(1) 1.6				6.0-5.0cm 20%; 3.5-1.0cm 20%; 1.0-0cm 60%	GW	1, 2		Gravel, grayish red (10 YR 4/2) to medium gray (N5) on fresh surface, subangular, low to high sphericity, 6cm max size, moderately well graded, some clayey silt, moderate yellowish brown (10 YR 4/2), moderate plasticity, trace of fine sand.
	2.5 to 4.0	0						3, 4		No Sample
Box 1 of 8	4.0 to 7.0	(1) 0.63					CL	5, 6, 7		Sandy Clay, medium light brown (5 YR 5/6), high plasticity, some silt + gravel, maximum gravel size 1.5cm.
	7.0 to 9.5	0				6.0cm 10%; 3.0-6.0 30%; 1.0-0cm 60%		8, 9		No Sample.
	9.5 to 13.5	0.96					GW/SP			Sandy gravel, medium light gray (N6), angular to subrounded, low to medium (cont'd)

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

This log has been re-copied to include correct graphic lithologic log. CKF

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 60-87

GEOLOGIST(S): DCB/TSD
DATE: 7/14/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
		(1) 0.94					GW/SP			Sphericity, 6.5mm max size, moderately well graded, trace of clay, dark yellowish orange (10YR 6/6) moderately plastic.
	10.5 to 12.0	(1) 0.75				60-4.0 25% 30-1.0 10% <1.0 65%	GW	11, 12		A 0.25 ft sand interval occurs at the base of this interval - Clayey sand moderately yellowish brown (10YR 5/4), medium to coarse grained, poorly graded subangular to rounded, high sphericity.
	12.0 to 14.5	(1) 1.14				0.0-4.0 35% 3.0-1.0 15% <1.0 50%	GW	13, 14		Same as above - minus the sand layer. Same as above
Box 1 of 2	14.5 to 17.0	(1) 0.73				5.0cm 5% 3.0-1.0 10% <1.0 85%	GM	15, 16		Sandy Gravel, very light gray (N8) on fresh surface, subangular to subrounded, moderate to low sphericity 5cm max size, poorly graded, some silt, light brown (5YR 6/4)
	17.0 to 19.5	3.10					CL/SW	17, 18, 19		Clay, mottled grayish orange (10YR 7/4) grayish yellow (5Y 8/4), high plasticity some fine sand + trace of gravel, max size 5mm. A sand interval 0.25ft occurs at the top of this interval and grades into the mottled clay, fine grained and variegated color. A fine to very coarse grained sand + fine gravel occurs within the lower half of this interval.
↑ 20.0	19.5 to 22.0									Gravelly sand, dark yellowish orange (cont'd)

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 6087

GEOLOGIST(S): DCB/TSD
DATE: 7/17/89

PROJECT NO: 667-11,22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION *	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
20.0 ↓	19.5 to 22.0	(2) 0.80				G=10% VCG 10% CG 15% mG 55% FG 10%	SP	21		(10YR 6/6), Subangular to subrounded, moderate to high sphericity, maximum size 1.5 cm, well graded, some silt, dark yellowish orange (10YR 6/6)
								22		Silty sand, dark yellowish orange (10YR 6/6) fine to very coarse grained, subrounded, low to high sphericity, poorly graded, trace of fine gravel max size 5 mm.
	22.0 to 24.5	1.50				7.4cm 15% VCG 30% CG 15% mG 10% LmG 30%	SW	23		Gravelly sand, grayish orange (10YR 7/4), very fine to coarse grained sand (very fine sand is restricted to upper 5 inches of interval) Subangular to rounded, well graded, trace of silt
								24		
Boxes 1/2 of 2	24.5 to 27.0	(1) 1.85				7.4cm 15% G/20% VCG 15% CG 25% mG 10% LmG 15%	CL	25		Upper half of this interval is the same as above. The lower half consists of a sandy clay grayish orange (10YR 7/4) medium plasticity, some gravel.
								26		
								27		
	27.0 to 29.0	(1) 1.13					CL	28		Clay mottled light olive gray (5Y 6/1) and dark yellowish orange (10YR 6/6), high plasticity, some sand grayish orange (10YR 7/4) fine to medium grained occurs in lenses ~1cm thick
								29		
	29.0 to 31.0	0								No Sample

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

* VCG = 1.0-2.0mm CG = 0.5-1.0mm
mG = 0.25-0.5mm FG = 0.125-0.25mm
G = Gravel = 2.0-4.0mm

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 6087

GEOLOGIST(S): DCB/TSD
DATE: 7/17/89
PROJECT NO: 6071.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 2 → 32.0	30.0 to 32.0	(2) 1.82	CL					31 32		Clay, medium light gray (N6), high plasticity, local occurances of dark tabular mineral (coal?),

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 60-87

DATES DRILLED
ELEVATION
GEOLOGIST(S) DCB/TSD
DATE 7/14/89
CHECKED BY DATE

USCS symbol

PROJECT NO. 6-7-1127

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF ~~CORE IN RUN~~	SAMPLE NUMBER	FEET OF CORE ~~IN BOX~~	FEET OF ~~CORE~~ IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 to 2.5		1.15 (1)	GW			(cm) 6.0-5.0 / 20% 3.5-1.0 / 20% <1.0 / 60%			Gravel, grayish red (10 YR 4/2) to medium gray (N5) on fresh surface, subangular, low to high sphericity, 6 cm maximum size, moderately well graded, some clayey silt, moderate yellowish brown (10 YR 4/2), moderate plasticity, trace of fine sand
	2.5 to 4.0		0					2.5		No Sample
Box 1 of 2	4.0 to 7.0		.63 (1)	CL				4.0		Sandy Clay, medium light brown (5 YR 5/6), high plasticity, some silt and gravel, maximum gravel size 1.5 cm
	7.0 to 9.5		0				6.0 cm / 10% 3.0-1.0 / 30% <1.0 cm / 60%	7.0		No Sample
	9.5 to 10.5		.96	GW/SP				9.5		Sandy Gravel, medium light gray (N6), angular to subrounded, low

NOTES General - The USCS is modified for this log as follows material amounts are estimated by percent volume not percent weight.
1) Badly broken core, accurate measurement not possible
2) core breaks cannot be matched - accurate measurement not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 60-87

DATES DRILLED
ELEVATION
GEOLOGIST(S)
DATE 7/14/87
CHECKED BY

PROJECT NO

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (Interval)	SAMPLE NUMBER	FEET OF CORE IN BOX (Interval)	FEET OF CORE IN RUN (DATE)	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	9.5		0.94(1)	GW/SP						TO medium sphericity 6.5mm maximum size, moderately well graded, trace of clay, dark yellowish orange (10YR6/6) moderately plastic A 0.25 ft sand interval occures at the base of This interval - Clayey sand moderately yellowish brown (10YR 5/4), medium TO coarse grained, poorly graded subangular TO rounded, high sphericity.
	10.5-12.0		0.75(1)	GW			6.0-4.0 25% / 3.0-1.0 10% / <1.0 65%	11		
	~~10.5~~ ~~12.0~~							12		
	12.0-14.5		1.14(1)	GW			6.0-4.0 35% / 3.0-1.0 15% / <1.0 50%	13		same as above - minus the sand layer.
								14		same as above.
	~~12.0~~ ~~14.5~~									
BOX 1 of 2	14.5-17.0		0.73(1)	GM			50 cm 5% / 3.0-1.0 10% / <1.0 85%	15 / 16		Sandy Gravel, very light gray (N8) on fresh surface, subangular to subrounded, moderate to low sphericity, 5cm. max size, poorly graded; some silt, light brown (5 YR 6/4).
	~~14.5~~ ~~17.0~~							17		
	17.0-19.5		3.10	CL / SW				18 / 19		Clay, mottled grayish orange (10 YR 7/4), grayish yellow (5 Y 8/4), high plasticity, some fine sand and trace of gravel, max. size 5mm. A sand interval .25 ft occurs at the top of this interval and grades into the mottled clay, fine grained and variegated color. A fine to very coarse grained
	~~17.0~~									
20.0	19.5-22.0									

NOTES

ROCKY FLATS PLANT

FIGURE NO. 2-1

LOG OF BORING NO. 60-87

DATES DRILLED
ELEVATION
GEOLOGIST(S)
DATE 7/17/89
CHECKED BY

DATE

PROJECT NO

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF ~~CORE IN RUN~~ INTERVAL	SAMPLE NUMBER	FEET OF CORE ~~IN BOX~~	~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION *	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
20.0 ↓	19.5-22.0 ~~19.5~~		0.80 (2)	SP				G=10% VCG 10% CG 15% MG 55% FG 10%	21		Sand and fine gravel occurs within the lower half of this interval; Gravelly Sand, dark yellowish orange (10 YR 6/6), subangular to subrounded, moderate to high sphericity, maximum size 1.5 cm, well graded, some silt dark yellowish orange (10 YR 6/6)
	~~22.0~~ 22.0-24.5 ~~22.0~~		1.50	SW				>.4cm 15% VCG 30% CG 15% MG 10% <.25mm 30%	22 23 24		Silty Sand, dark yellowish orange (10 YR 6/6), fine to very coarse grained, subrounded, low to high sphericity, poorly graded, trace of fine gravel max. size 5 mm.
BOXES 1/2 of 2	~~24.5~~ 24.5-27.0 ~~24.5~~		1.85 (1)	CL				>.4cm 15% G/20% VCG 15% CG 25% MG/10% <MG/15%	25 26		Gravelly Sand, grayish orange (10 YR 7/4) very fine to coarse grained sand (very fine sand is restricted to upper 5 inches of interval. Subangular to rounded, ~~maximum size~~ well graded, Trace of silt. Upper half of this interval is the same as above The lower half consists of a Sandy Clay * grayish orange (10 YR 7/4) medium plasticity, some gravel
	~~27.0~~ 27.0-29.0 ~~27.0~~		1.13 (1)	CL					27 28		~~Sandy~~ Clay mottled light olive gray (5 Y 6/1) and dark yellowish orange (10 YR 6/6), high plasticity, some sand (grayish orange (10 YR 7/4) fine to medium grained occurs in lenses ~1 cm thick.
	~~29.0~~ 29.0-31.0		0						29		~~Clay, medium light gray (NG), high plasticity, local occurrences of dark tabular carbonaceous(?) material (coal?).~~ DCB

NOTES * VCG = 1.0-2.0 mm, CG = .5-1.0 mm, MG = .25-.5 mm, FG = 1.25-.25 mm
G = GRAVEL 2.0-4.0 mm

ROCKY FLATS PLANT

FIGURE NO. 2-1

LOG OF BORING NO. 60-87

DATES DRILLED
ELEVATION
GEOLOGIST(S) DCB/TSD
DATE 7/17/89
CHECKED BY DATE

USCS symbol

PROJECT NO 667-11

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF ~~CORE IN RUN~~ ~~Interval~~ in box	SAMPLE NUMBER	FEET OF CORE ~~IN BOX~~ ~~Interval~~	FEET ~~OF CORE IN RUN~~	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 2 → 32	~~Box 2 of 2~~ 31.0 to 32.0 → 32		1.82 (2)	CL					31		Clay, med mm light gray (NG), high plasticity, local occurrences of dark tabular mineral (coal?)
									32		

NOTES General.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 61-87

GEOLOGIST(S): DCB/TSD
DATE: 7/17/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 60 1.5	(1) 1.74				6.0-3.0 20% 3.0-1.0 35% 1.0-.40 20% <.4 10% Clay 15%	GC	1		Clayey Gravel medium light gray (N6) to moderately reddish brown (10 R 4/6). Angular to subrounded, low to moderate sphericity, 5.5 cm = max size, moderately well graded, trace of sand + roots.
	1.5-2.0	0						2		No Sample
	2.0-3.8	(1) 1.75				6.0-3.0 cm 20% 3.0-1.0 35% 1.0-.40 20% <.4 Clay 10% Clay 15%	GW	3		Gravel, medium light gray (N6) to very light gray (N8), angular to subrounded, low to moderate sphericity, moderately graded, 4.5 cm = max size, some micaceous silty clay (moderate reddish brown (10 R 4/6) + sand. Lower 1/3 of interval consists of description 4' to 5'.
	3.8-4.0	0						4		No Sample
Box 1 of 3	4.0-5.9	(1) 1.82	–	–		5.0-3.0 10% 3.0-1.0 25% 1.0-.40 15% .40-SILT 20% Clay 30%	GC	5		Clayey, Sandy, Gravel, light bluish gray (5B 7/1) (Sand + clay are grayish orange 10 YR 7/4), angular to rounded, low to moderate sphericity, max size 6.5 cm, moderate grading, trace of mica + silt.
	5.9-6.0	0						6		No Sample
	6.0-7.8	(1) 1.82				"	GC	7		Same as above, change in color of clay fraction moderate yellowish brown (10 YR 5/4)
	7.8-8.0	0						8		No Sample
	8.0-9.2	(1) 1.8				"	GC	9		Same as above, change in color of clay fraction, dark yellowish orange (10 YR 6/6).
10.0	9.2-10.0	0								No Sample

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

* Clay 1/2040 - 1/256 mm
* SILT < 1/16 mm

B & 100-200 cpm
Background = 60-100 cpm

This log has been re-copied to include correct graphic lithologic log. CKE

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 61-87

GEOLOGIST(S): DCB/TSD
DATE: 7/17/89

PROJECT NO: 667-1120

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
10.0 ↓	10.0 to 10.8	(1) 0.58				6 0-3.0 cm 15% 3.0-1.0 10% 1.0-2 25% Sand 25% Clay 25%	GC			Clayey Sandy Gravel, medium dark gray (N4) (Sand + clay are grayish orange 10 YR 7/4) angular to rounded, low to moderate sphericity, max size 3.5 cm, moderate grading, trace silt + mica
	10.8 to 12.0	0						11		No sample
	12.0 to 14.0	(1) 2.34					GC	12 13		Clayey Sandy Gravel variegated coloring grey, pink, very light gray, orange brown dominant color medium light gray (N6) (Clay + sand mottled moderate yellowish brown 10 YR 5/4 + dark yellowish orange 10 YR 6/6) angular to rounded, low to moderate spherricity, max size 7 cm, some mica, moderately graded.
Box 2 of 3	14.0 to 15.6	(1) 1.36					GC	14 15		Same As Above
	15.6 to 16.0	0						16		No Sample
	16.0 to 18.0	2.32					CL	17		Gravelly Clay, grayish orange (10 YR 7/4) low plasticity, some sand- gravel + sand fraction approach 50% of sample volume
↑ 19.8	18.0 to 19.8	1.76					CL/SC	18 19		Same as above - lower quarter of interval grades to sand. Clayey fine to very coarse sand, grayish orange (10 YR 7/4) subangular to rounded, moderate sphericity, poorly graded, some gravel.
	19.8 to 20.0	0								No sample

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

* Sand 0.0675mm - 2.0mm
* Clay 1/2048 - 1/256 mm

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 61-87

GEOLOGIST(S): DCB/TSD
DATE: 7/17/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
20.0 ↓ Box 3 of 3	20.0 to 21.8	(1) 1.77					CL	21		Clay mottled light gray (N7) + dark yellowish orange (10 YR 6/6) high plasticity. Trace of fine to medium sand + mica. Bottom 1/3 of interval is sandy clay moderate yellowish brown (10 YR 5/4), low plasticity some gravel - max size = 2.5 cm
	21.8-22.0	0					—	22		No Sample
	22.0 - 22.6	0.43					SW			Gravelly very fine to coarse sand moderate yellowish brown (10 YR 5/4) subrounded to rounded, moderate sphericity, well graded, some silt. max gravel size is 2cm.
	22.6 to 24.0	0					—	23		No Sample
	24.0 to 29.0	0					—	24, 25, 26, 27, 28		No Sample
	29.0 to 31.1	(1) 1.25					CL	29		Clay medium light gray (N6) and dark yellowish orange (10 YR 6/6), high plasticity, trace of fine + medium grained sand.

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 61-87

GEOLOGIST(S): DCB/TSD
DATE: 7/17/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 3 of 3	29.0 to 31.1						CL	31		
	31.1 to 33.1	(1) 1.87					CL	32		Description is same as above
↑ 34.0	33.1 to 34.0	(1) 1.86						33		same as above change in color of clay. Top 1/3 of interval is moderate brown (5YR 3/4), lower 2/3 of interval is moderate yellowish brown (10YR 5/4).
								34		

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. G1-87

PAGE 1 OF

DATES DRILLED
ELEVATION
GEOLOGIST(S) DCB/TSD
DATE
CHECKED BY DATE: 7/17/88

USCS SYMBOL

PROJECT NO. 667-11

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN	SAMPLE NUMBER	FEET OF CORE IN BOX	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
00 ↓	00-1.5		1.74(1)	GC				6.0-3.0 20% 3.0-1.0 35% 1.0-.40 20% <.40/10% CLAY/15%	1		Clayey gravel, medium light gray (N6) to moderately well redish brown (10R 4/6) angular to subrounded, low to moderate sphericity, 5.5 cm = max size, moderately well graded, trace of sand & roots
	15-20		0					(cm)	2		No Sample
	20-3.8		1.75(1)	GW				6.0-3.0 20% 3.0-1.0 35% 1.0-.40 20% <.40, >CLAY 10% CLAY/15%	3		Gravel, medium light gray (N6) to very light gray (N8), angular to subrounded, low to moderate sphericity, moderate grade, 4.5 cm = maximum size, some micaceous silty clay (moderate redish brown (10R 4/6) & sand lower 1/3 of interval consists of description 4' to 5.4'.
	3.8-40		0						4		No Sample
Box 1 of 3	40-59		1.82(1)	GC				5.0-3.0 10% 3.0-1.0 25% 1.0-.40 15% .40-SILT 50% CLAY 30%	5		Clayey, Sandy Gravel, light bluish gray (5B 7/1) (sand and clay are grayish orange 10 YR 7/4), angular to rounded, low to moderate sphericity, max size 6.5 cm, moderate grading, trace of mica and silt.
	5.9-6.0		0						6		NO SAMPLE
	60-7.8		1.82(1)	GC				"	7		Same as above, change in color of clay fraction moderate yellowish brown (10 YR 5/4).
	7.8-80		0						8		No Sample
	80-9.2		1.8(1)	DCB GC				"	9		Same as above, change in color of clay fraction dark yellowish orange (10 YR 6/6)
↑ 10.0	92-10.0		0								No Sample

NOTES: (1) General – The USCS is modified for this

* CLAY 1/2048 – 1/256 mm
* SILT – < 1/16 mm

(1)

(2)

Bg = 100-200 cpm

Background = 60 100 cpm

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 61-87

DATES DRILLED
ELEVATION
GEOLOGIST(S) DCB/TSD
DATE 2/17/89
CHECKED BY DATE USCS symbol

PROJECT NO. 667-11

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	SAMPLE NUMBER	FEET OF CORE IN BOX	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
10.0	10.0 to 10.8		(1) .58	GC				60-3.0 15% 3.0-1.0 10% 1.0-2 25%			Clayey, Sandy Gravel, medium dark gray (N4) (Sand and clay are grayish orange 10 YR 7/4), angular to rounded, low to moderate sphericity, max size 3.5cm, moderate grading, DCB trace silt and mica.
Box 2 of 3	10.8 to 12.0		0					SAND 25% CLAY 25%	11		
	12.0 to 14.0		(1) 2.34	GC					12 13		Clayey Sandy Gravel, variegated coloring gray, pink, very light gray orange brown, dominant color medium light gray (N6), (clay and sand mottled moderate yellowish brown 10 YR 5/4 and dark yellowish orange 10 YR 6/6), angular to rounded, low to moderate sphericity, max size 7 cm, some mica, moderately graded.
	14.0 to 15.6		(1) 1.36	GC					14 15		Same As Above
	15.6 to 16.0		0								No Sample
	16.0 to 18.0		2.32	CL					16 17		Gravelly Clay, grayish orange (10 YR 7/4) low plasticity, some sand - Gravel and sand fracture approach 50' of sample volume.
	18.0 to 19.8		1.76	CL/SC					18 19		Same as above - lower quarter of interval grades to sand. Clayey fine to very coarse sand, grayish orange (10 YR 7/4) subangular to rounded, moderate sphericity, poorly graded some gravel.
19.8	19.8 to 20.0		0								No Sample

NOTES: General

(1)

(2)

* SAND .0675 mm - 2.0 mm
* CLAY 1/2048 - 1/256 mm

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 61-87

DATES DRILLED
ELEVATION
GEOLOGIST(S) OCO/TSO
DATE
CHECKED BY DATE 7/17/89

PROJECT NO.

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN	SAMPLE NUMBER	FEET OF CORE IN BOX	FEET OF CORE IN RUN (USCS symbol)	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
20.0 ↓	20.0 TO 21.8		(1) 1.77	CL				21		Clay, mottled light gray (N7) & dark yellowish orange (10YR 6/6) high plasticity, trace of fine to medium sand & mica. Bottom 1/3 of interval is sandy clay moderate yellowish brown (10YR 5/4), low plasticity some gravel - max size - 2 cm.
	21.8 TO 22		0	—				22		No sample
	22.0 TO 22.6		0.43	SW						Gravelly sand moderate yellowish brown (10YR 5/4) V fine to coarse subrounded to rounded, moderate sphericity, well graded, some silt. max gravel size is 2 cm.
	22.6 TO 24.0		0	—				23		No Sample
BOX 3 of 3	24.0 TO 29.0		0	—				24 25 26 27 28		~~Clay medium light gray (N6) & dark yellowish orange (10YR 6/6) high~~ No Sample
	29.0 TO 31.1		(1) 1.25	CL				29		Clay medium light gray (N6) & dark yellowish orange (10YR 6/6), high plasticity, trace of fine to medium grained sand.

NOTES

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 61-87

DATES DRILLED
ELEVATION
GEOLOGIST(S)
DATE
CHECKED BY DATE PROJECT NO.

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN	SAMPLE NUMBER	FEET OF CORE IN BOX	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	29.0 31.1			CC				31		
	31.1 TO 33.1		1.87 (1)	CL				32		Description is same as above.
	33.1 TO 34.0		1.86 (1)					33 34		Same as above change in color of clay Top 1/3 of interval is moderate brown (5YR 3/4), lower 2/3 of interval is moderate yellowish brown (10YR 5/4).
34.0 ↑ BOX 3 of 3								35 36 37 38 39		

NOTES

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. BH G1-87

PAGE / OF /

GEOLOGIST(S): DCB
DATE: 8/29/89

PROJECT NO: 667-11-22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0 0 ↓	0.0 to 1.1	(1) 7				>50% Clay	CL	1		Clay, dark yellowish brown (10 YR 4/2) and very pale orange (10 YR 8/2), moderate plasticity, abundant caliche precipitate disseminated throughout clay, some gravel.
	1.1 to 2.0	0								No Sample
	2.0 to 2.9	(1) .3				>50% Gravel	GC	2		Clayey gravel, dominantly light gray (N7) matrix, is very pale orange (10 YR 8/2), poorly graded, angular rock. Size 6 cm. clay matrix has caliche precip. throughout.
	2.9 to 3.5	0						3		No Sample
N	3.5 to 5.0	N/D				~~>50% Gravel~~ >50% Clay	~~GC~~	4		~~Clayey Gravel~~ as above (reference interval 2.0 to 2.9 ft.) Claystone, grayish orange (10 YR 7/4), bedding not apparent, highly weathered, slightly friable, abundant caliche precip. occurs throughout this weathered rock.
1 of 2	5.0 to 6.5	0						5, 6		No Sample
5 of 2	6.5 to 9.0	(1) 2.2				>50% Clay		7, 8, 9		Claystone as above (reference interval 3.7 to 5.0 ft.)
↑ 9.0	9.0									Bottom of Box 1 of 2 at 9.0 ft.

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

Box 2 of 2, BH G187 is ~~not~~ accounted for, not in trailer.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 6287

GEOLOGIST(S): DCB HSD
DATE: 7/18/89

PROJECT NO: 6677-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 to 2.0	1.29					CL	1, 2		Silty Clay, pale yellowish brown (10 YR 6/2), moderate plasticity, trace of sand.
	2.0 to 4.0	(1) 0.43					CL	3, 4		Gravelly Clay, dark yellowish brown (10 YR 4/2) moderate plasticity, some sand, max gravel size 4cm.
Box 1 of 3	4.0 to 7.0	0						5, 6, 7		
	7.0 to 8.0	0						8		
	8.0 to 9.5	0						9		
	9.5 to 10.5	(1) 1.6				6cm to 2mm	GW			Clayey sandy Gravel, very light gray (N8) to medium gray (N6) (cont)

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

This log has been re-copied to include correct graphic lithologic log. CKF

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 62-87

GEOLOGIST(S): DCB/TSD
DATE: 7/18/89
PROJECT NO: 6067-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 3	9.5 to 10.5	Cont'd				VCG-MG =28% Fines =32%	GW			... Subangular to subrounded moderately graded. Trace of silt
	10.5 to 12.0	(1) 1.20					GW	11		Same as above
	12.0 to 14.5	(1) 1.95				55cm to 2mm =10% VCG =20% MG-FG =70%	SW	12, 13, 14		Gravelly sand, yellowish gray (5Y 8/1), subangular to rounded, low to high sphericity, well graded, some silt.
	14.5 to 17.0	(1) 1.39				4cm-2mm =50% VCG-CG =40% Fines =10% VCG =5% CG =5%		15, 16, 17		Sandy Gravel, moderate brown, (5YR 4/4), subrounded/subangular low to moderate sphericity, poorly graded, trace of silt.
↑ 17.9	17.0 to 17.9	(1) 0.90				MG=70% Fines =20%	SP			Sand, grayish orange (10YR 7/4), subrounded, poorly graded, some silt. At 17.5 ft. the interval changes to very fine grained sand, yellowish gray (5Y 8/1), some silt, trace coarse to medium grained sand.
17.9 ↓ Box 2 of 3	17.9 to 19.5	(2) 1.38				MG =20% FG =80%	CL SP	18, 19		Alternating fine to medium grained sand + clay. Sand, yellowish gray (5Y 8/1), grayish orange (10YR 7/4). Clay yellowish gray (5Y 8/1) grayish orange (10YR 7/4), moderate plasticity.

see next page

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 62-87

GEOLOGIST(S): TSD / DCB
DATE: 7/18/89

PROJECT NO: 6617-1622

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
17.9 ↓ Box 2 of 3	19.5 to 22.0	(2) 2.14				5.5cm to 2mm =50% VCG =20% Fines =30%	CL / GM	21		Clay, yellowish gray (5Y 8/1), high plasticity, some sand. At 21 ft the interval grades into a silty clayey Gravel, variegated coloring, gray, pink, very light pink, medium gray (N5) to grayish orange pink (5YR 7/2) silt + clay coloring grayish orange (10YR 7/4) subrounded, moderate sphericity, moderate grading, some sand.
	22.0 to 24.5	(2) 2.26				6cm to 2mm =55% VCG =20% Fines =25%	GM / CL	22, 23, 24		Same as above interval from 21 ft + below, max gravel size 6cm. At 22.9 ft interval grades into a clay. Silty clay, mottled very light gray (N8) + grayish orange (10R 7/4), high plasticity, trace of sand.
	24.5 to 26.5	(2) 1.78					CL	25, 26		Same as above from 22.9 ft interval + below
↑ 27.5	26.5 to 27.5	1.0 +0.6? see note					CL	27		same as above
27.5 Box 3 of 3	27.5 to 28.5	1.0					CL	28		Note: 0.6 ft of material same as above occurs in box 3 of 3 + is labeled as part of 27.5 ft interval - CL. Silty clay, grayish orange (10YR 7/4) medium plasticity, with vertical stringers of fine to very fine sand.
(3) 30? 32?	28.5 to 30.0	1.5					CL	29		Clay, very light gray (N8), grayish orange (10YR 7/4), high plasticity. Bottom of Box

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.
(3) Box may be mislabeled based on interval blocks.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 62-87

DATES DRILLED
ELEVATION
GEOLOGIST(S) DCB/TSD
DATE
CHECKED BY
DATE 7/18/89

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (interval)	SAMPLE NUMBER	FEET OF CORE IN BOX (interval)	USCS symbol ~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 TO 2.0		1.29	CL					1		Silty Clay, pale yellowish brown (10 YR 6/2), moderate plasticity, trace of sand
	2.0 TO 4.0		0.43 (1)	CL					2, 3		Gravelly, Clay dark yellowish brown (10 YR 4/2) moderate plasticity, some sand, max gravel size 4 cm.
BOX 1 of —	4.0 TO 7.0		0						4, 5, 6		~~Clay~~ DCB
	7.0 TO 8.0		0						7		
	8.0 TO 9.5		0						8, 9		
	9.5 TO		0.6 (1)	GW				6 cm to 2 mm 40%			~~See Following~~ DCB Clayey, Gravel, Sandy

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 62-87

DATES DRILLED
ELEVATION
GEOLOGIST(S) DCB/TSD
DATE
CHECKED BY DATE 7/18/89

PROJECT NO 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN BOX (FT BELOW GL)	SAMPLE NUMBER	FEET OF CORE IN BOX (USCS LD)	USCS symbol / FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	9.5 TO 10.5	(1) 1.63 DCB		GW						very light gray (N8) to medium gray (N6) subangular to subrounded moderately graded, trace of silt.
	10.5 TO 12.0	(1) 1.20 DCB		GW	5.5cm TO 2mm ≈10% VCG = 20% MG		VC G TO MG ≈ 20% Fines ≈ 20%	11		same as above
	12.0 TO 14.5	(1) 1.95 DCB		SW			5.5cm TO 2mm ≈10% VCG = 20% MG to FG 70%	12, 13, 14		Gravelly sand, yellowish gray (5 Y 8/1), subangular to rounded, low to high sphericity, well graded, some silt.
179 to 179	14.5 TO 17.0	(1) 1.39 DCB					4cm to 2mm 50% VCG + CG 40% Fines 10%	15, 16		Sandy Gravel, moderate brown (5 YR 4/4), subrounded/subangular, low to moderate sphericity, poorly graded, trace of silt.
179 to 179.5	17.0 TO 17.9	(1) 0.90		SP			VCG 5% CG 5% MG TO Fines 20%	17, 18		Sand, grayish orange (10 YR 7/4), subrounded, poorly graded, some silt. At 17.5 feet the interval changes to very fine grained Sand, yellowish gray (5 Y 8/1), some silt trace coarse to medium grained sand
179.5 to 27.5	17.9 TO 19.5	(2) 1.38 DCB		CL/SP		80% FG + Fines	MG 20% FG 80% + Fines	19		Alternating fine to medium grained sand and Clay, Sand, yellowish gray (5 Y 8/1), grayish orange (10 YR 7/4). Clay yellowish gray (5 Y 8/1) grayish orange (10 YR 7/4) moderate plastic

NOTES. General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 62-87

DATES DRILLED
ELEVATION
GEOLOGIST(S) TSD/DCB
DATE 7/18/89
CHECKED BY
DATE

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	USCS SYMBOL FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
17.9	19.5 to 22		(2) 2.14	CL/ GM				5.5cm to 2mm 50% VCG 20% Fines 30%	21		Clay, yellowish gray (5 y 8/1), high plasticity, some sand. At 21 feet the interval grades into a Silty Clayey Gravel, variegated coloring, gray, pink very light pink, ~~CB~~ Medium gray (N5) to grayish orange pink (5 YR 7/2) silt and clay coloring grayish orange (10 YR 7/4), subrounded, moderate sphericity moderate grading, some sand.
	22 to 24.5		(2) 2.26	GM/ CL				6cm to 2mm 55% VCG 20% Fines 25%	22 23 24		Same as interval above from 21 feet and below, max gravel size 6 cm. At 22.9 feet interval grades into a Clay Silty Clay, mottled very light gray (N8) and grayish orange (10 YR 7/4), high plasticity, trace of sand.
Box 2 of 3	24.5 to 26.5		(2) 1.78	CL					25 26		Same as above from 22.9 feet interval and below.
27.5	26.5 to 27.5		1.0' + .6" see Notes	CL					27		Same as above
27.5 Box 3 of 3	27.5 to 28.5		1.0'	CL					28		Note - 0.6 feet of material same as above occurs in box 3 of 3 and is labeled as part of 27.5 feet interval - CL.
(3) 30? 32?	28.5 to 30.0		1.5'	CL					29		Silty Clay, grayish orange (10 YR 7/4), medium plasticity, with vertical stringers of fine to very fine sand. Clay, very light gray (N8), grayish orange (10 YR 7/4), high plasticity. Bottom of Box

NOTES. General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible. (3) Box may be mislabeled based on interval blocks.

ROCKY FLATS PLANT

FIGURE NO.

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LOG OF BORING NO. 63-87

DATES DRILLED
ELEVATION
GEOLOGIST(S)
DATE
CHECKED BY DATE

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (interval)	SAMPLE NUMBER	FEET OF CORE IN BOX (interval)	USCS symbol ~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0 to ~~19.5~~ 17.5 DCB Box 1 of 2	9.5 TO 12.0		0					11		
	12.0 TO 13.0		0					12		
	13.0 TO 14.5		1.72 (1)	SW			VCG <20' CG+MG 60' ~~VCG~~ 20'	13 14		~~Clayey~~, fine to very coarse Sand, ~~moderate~~ orange (5 YR 8/4), angular to subrounded, moderate to high sphericity, well graded, some clay
	14.5 TO 17.0		3.21 (1)	SP			4mm ~~12mm~~ 10' VCG 50' MG ~~CG~~ 30' 10' fines	15 16 17		Clayey, Gravelly medium to very coarse grained Sand, grayish orange (10 YR 7/4), angular to subrounded, low to high sphericity, moderately well sorted. At 15.5' (est) changes to very fine to coarse grained Sandy Clay, pinkish gray (5 YR 8/1) and grayish orange (10 YR 7/4), moderate plasticity, increase in gravel fraction in lower 1/2 foot, max size 5cm.
↑ ~~19.5~~ 17.5 DCB	17.0' TO ~~19.5~~ 17.5'		0.49 (1)				2.7cm to 10cm 25% <1cm 75'	18 19		Clayey, Sandy Gravel variegated color pink, gray, white, red, black, dominant colors moderate orange pink (10 R 7/4), medium gray (N5), subangular to subrounded, sphericity is low to moderate, ~~[illegible]~~ DCB moderately graded, ~~[illegible]~~ DCB

NOTES General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible. 3) VCG - Very Coarse Grained, Coarse Grained = CG, MG = Medium Grained FG = Fine Grained

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 63-87

GEOLOGIST(S): DCG/TSD
DATE: 7/18/89

PROJECT NO: 607-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 3	0.0 to 2.0	(1) 0.2					CL	1, 2		Gravelly clay pale yellowish brown (10 YR 6/2) medium to high plasticity, some sand.
	2.0 to 4.0	0						3		No sample
	4.0 to 5.0	0						4, 5		No sample
	5.0 to 7.0	(1) 2.77					CL	6, 7		Sandy, Gravelly clay, grayish orange (10 YR 7/4), moderate plasticity. max gravel size 4.5 cm change in clay color at 6.5 ft (est.), dark yellowish brown (10 YR 4/2).
	7.0 to 9.5	(1) 0.75					CL	8, 9		Same as above, dark yellowish brown (10 YR 4/2)
	9.5 to 12.0	0								

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

This log has been re-copied to include correct graphic lithologic log. CKF

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 6387

GEOLOGIST(S): TSD / DCB
DATE: 7/18/89
PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	9.5 to 120	0						11		No Sample
	12.0 to 13.0	0						12		No Sample
Box 1 of 3	13.0 to 14.5	(1) 1.72				VCG =20% CG-MG =60% FG =20%	SW	13, 14		Fine to very coarse grained sand, moderate orange (5YR 8/4), angular to subrounded, moderate to high sphericity, well graded, some clay.
	14.5 to 17.0	(1) 3.21				4mm to 2mm =10% VCG =50% CG-MG =30% FG =10%	SW	15, 16		Clayey, gravelly, medium to very coarse grained sand, grayish orange (10YR 7/4) angular to subrounded, low to high sphericity, moderately well graded. At 15.5 ft (est) interval changes to very fine to coarse grained sandy clay, pinkish gray (5YR 8/1) and grayish orange (10YR 7/4) moderate plasticity, increase in gravel fraction in lower 1/3 ft, max size = 5cm.
↑ 17.5	17.0 to 17.5	(1) 0.49				3.5cm - 2mm	SW	17		Gravelly sand, moderate yellowish brown (10YR 5/4), subangular to subrounded, low to high sphericity, well graded, some clay
17.5 ↓ Box 2 of 3	17.5 to 19.5	(1) 1.85				=40% VCG =30% CG =20% Fine =10%	SW	18, 19		
	19.5 to 22.0	(1) 2.58								See next page

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 63-87

GEOLOGIST(S): TSD/DCB
DATE: 7/18/89
PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 3	19.5 to 22.0	(1) 2.58				4 cm to 2 mm = 10% VCG = 45% CG-MG = 35% Fines = 10%	SW	21		Sand, moderate yellowish brown (10 YR 5/4), subangular to rounded, low to high sphericity, moderately well graded, some clay. At 21 ft (est) interval changes to sandy clay, very light gray (N8), low to moderate plasticity, some gravel.
	22.0 to 24.5	(1) 4.2					CL	22, 23, 24		Silty clay, yellowish gray (5Y 8/1), moderate plasticity, trace of fine sand.
↑ 25.0	24.5 to 25.0	(1) 0.56					CL	25		Clay, yellowish gray (5Y 8/1), moderate plasticity, some silt.
25.0 ↓	25.0 to 25.5	(1) 1.0					CL			Silty clay, light gray (N7) and grayish orange (10 YR 7/4), moderate plasticity, vertical stringers of fine sand disseminated throughout core, up to 3cm in diameter.
Box 3 of 3	25.5 to 27.0	(1) 1.37					CL	26		As above
↑ 28.0	27.0 to 28.0	(1) 1.33					CL	27, 28		As Above
										Bottom of Box

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 63-87

DATES DRILLED
ELEVATION
GEOLOGIST(S) DCB/TSD USCS symbol
DATE
CHECKED BY DATE 7-18-89

PROJECT NO. 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW	SAMPLE NUMBER	FEET OF CORE IN BOX	FEET OF CORE IN ROW	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0' to 19.5' ~~4.5'(est)~~ DCB	0.0 to 2.0		(1) .2'	CL				1		~~Clayey~~ gravelly clay pale yellowish brown (10YR 6/2) Medium to high plasticity, some sand. ~~+gravel~~
	~~2.0-4.0~~ ~~0~~ DCB		0					2, 3		No Sample
	4.0 to 5.0		0					4, 5		No Sample
Box 1 of 3	5.0 to 7.0		(1) 2.77'	CL				6		Sandy, Gravelly Clay, grayish orange (10 YR 7/4), moderate plasticity. Max gravel size 4.5 cm Change in clay color at 6.5' (est), dark yellowish brown (10 YR 4/2).
	7.0 to 9.5		0.75 (1)	CL				7, 8, 9		same as above, dark yellowish brown (10 YR 4/2).
	9.5 TO 12.0									

NOTES General

(1)

(2)

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 63-87

DATES DRILLED
ELEVATION
GEOLOGIST(S) TSD/DCB
DATE 7/18/89
CHECKED BY DATE

USCS symbol

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (interval)	SAMPLE NUMBER	FEET OF CORE IN BOX (interval)	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0 to 17.5	9.5 to 12		0					11		
	12 to 13		0					12		
Box 1 of 3 + Box 2 of 3 DCB	13 to 14.5		(1) 1.72	SW		VCG 20% CG&MG 60% FG 20%	DCB	13 14		Fine to very coarse grained Sand, moderate orange (5 YR 8/4), angular to subrounded, moderate to high sphericity, well graded, some clay.
	14.5 to 17.0		(1) 3.21	SW		4mm to 2mm 10% VCG 50% CG&MG 30% FG 10%	DCB	15 16		Clayey, Gravelly medium to very coarse grained Sand, grayish orange (10 YR 7/4), angular to subrounded, low to high sphericity, moderately well graded. At 15.5 feet (est.) interval changes to very fine to coarse grained sandy clay, pinkish gray (5 YR 8/1) and grayish orange (10 YR 7/4) moderate plasticity, increase in gravel fraction in lower 1/2 foot, max. size 5 cm.
	17.0 to 17.5		0.49	SW			3.5 cm	17		
Box 2 of 3 17.5 to 22	17.5 to 19.5		(1) 1.85	SW			to 2mm 40% VCG 30% CG 20% Fine 10%	18 19	DCB	Gravelly Sand, moderate yellowish brown (10 YR 5/4), subangular to subrounded, low to high sphericity, well graded, some clay. DCB
	19.5 to 22		2.58 (1)							see next page

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 63-87

DATES DRILLED
ELEVATION
GEOLOGIST(S) TSD/DCB
DATE 7/18/89
CHECKED BY DATE

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	USCS SYMBOL ~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 3 170 to 250	19.5 to 22 DCB		(1) 2.58	SW				4 cm to 2 mm 10% VCG 45% CGR MG 35% Fines 10%	21		Sand, moderate yellowish brown (10 YR 5/4), subangular to rounded, low to high sphericity, moderate well graded, some clay. At 21' (est) interval changes to Sandy Clay, very light gray (N8), low to moderate plasticity, some gravel.
	22 to 24.5		~~2.98~~ 4.2 (1)	CL					22 23 24		Silty Clay, yellowish gray (5 Y 8/1), moderate plasticity, trace of fine sand.
	24.5 to 25		.56 (1)	CL					25		Clay, yellowish gray 5 Y 8/1, moderate plasticity, some silt.
250' to 28.0' Box 3 of 3	25 to 25.5		1 (1)	CL							Silty Clay, light gray (N7) and grayish orange (10 YR 7/4) moderate plasticity, ~~[illegible]~~ of fine sand and vertical stringers dissemiated throughout core, up to 3 cm in diameter.
	25.5 to 27		(1) 1.37	CL					26		As Above
	27 to 28		(1) 1.33	CL					27		As Above
									28 29		Bottom of Box

NOTES General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 63-87

GEOLOGIST(S): DCB
DATE: 8/10/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0 0		(1) .4				>50% Clay	CL	1 2		Gravelly Clay, moderate brown (5 YR 3/4), moderate plasticity, max. gravel size 5.5 cm., trace of organic debris.
Box 3		(1) 0.0 ~~4~~ ND						3 4		Clay, grayish orange (10 YR 7/4), moderately high plasticity, trace of gravel and silt. Gravelly Clay at ~3.7 ft as above, calc, arenous.
Box 3 load	4.0 to 6.0	0						5 6		No Sample
	6.0 to 8.0	(1) 1.1				>50% Gravel	GC	7 8		Sandy Gravel, medium gray (N5), sand matrix is light brown (5 YR 5/6), subangular to subrounded, moderately graded max. size 5 cm., some clay and a gradual increase in the clay content with depth.
	8.0 to 10.0	ND						9		Clayey Gravel, medium light gray (N6), clay matrix is moderate yellowish brown

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 63-87

GEOLOGIST(S): DCB
DATE: 8/10/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 3 of 3	10.0 to 11.0	ND				>50% Gravel	GC	11		(10 YR 5/4) to grayish orange (10 YR 7/4), subangular, poorly graded, max size 3.5 cm.
	11.0 to 12.0	0						12		No Sample
	12.0 to 14.0	(1) 10				>50% Gravel	GC	13		As above (reference interval 9.5 to 11 ft) max gravel size is 5 cm
	14.0 to 16.0	ND	~~NO~~ DCB					14, 15		As above with color change in clay matrix to light brown (5YR 5/6)
Box 3 of 3	16.0 to 18.0		0					16, 17, 18		No Sample
	18.0 to 19.0		ND			>50% sand	GC	19		Gravelly, Clayey Sand, light brown (5 YR 5/6), angular to subrounded, ~~moderately~~ poorly graded, ~~max gravel size 5 cm~~ DCB vcg to fg sand, max. gravel size 5 cm. DCB
	19.0 to 20.0 DCB	DCB-2	ND							

NOTES. General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 63-87

GEOLOGIST(S): DCB
DATE: 8/10/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	19.0 to 21.0	ND	DCB ~~ND~~			>50% sand	GC			As above
	21.0 to 23.0	(1) .7	~~(1)~~ DCB ~~.7~~			>50% clay	CL	21, 22		Interval grades to silty clay at 20.8 ft. Silty Clay, grayish orange (10 YR 7/4), low to moderate plasticity, some gravel and sand
Box 2 of 3	23.0 to 25.0	ND	DCB ~~ND~~					23, 24		As above with trace of gravel & sandy, moderate plasticity.
	25.0 to 27.0	ND	DCB ~~ND~~			>50% clay		25, 26		Clay Stone, grayish orange (10 YR 7/4), bedding not apparent, highly weathered moderately friable, carbonate mineralization occurs locally, color grades to very light gray (N8).
27.5 ↑	27.0 to 27.5							27		
27.5 ↓ Box 3 of 3	27.5 to 29.0	ND	DCB ~~ND~~					28		
↑ 30.0	29.0 to 30	0	~~DCB~~					29		Bottom of Box 3 of 3 at 29.0 Ft.

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 65-87

GEOLOGIST(S): TSD/DCB
DATE: 7/19/89

PROJECT NO: 667-1127

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓ Box 1 of 3	0.0 to 2.0	(1) 1.7				4.5cm–2.0mm =40% VCG–FCG =30% <FCG =30%	GC	1, 2		Sandy Clayey Gravel medium gray (N5) subangular to subrounded moderately graded, clay color is dark yellowish brown (10 YR 4/2).
	2.0 to 4.0	(1) 1.75					CL	3, 4		Gravelly Clay yellowish gray (5Y 8/1) medium plasticity, Some silt + sand
	4.0 to 7.0	(1) 2.40					CL	5, 6, 7		Same as above
	7.0 to 9.5	(1) 1.25				3.0cm–2mm =65% VCG–VFG =30% <VFG =5%	GW	8, 9		Gravel light gray (N7) angular to well rounded, well graded some sand, trace of clay + silt.
										see next page

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

This log has been re-copied to include correct graphic lithologic log. CKF

ROCKY FLATS PLANT

FIGURE NO.

B & Background – 250–300 cpm
B & Core Box 1 – 50–200 cpm
Core Box 2 – 50–150 cpm
Core Box 3 – 50–150 cpm

LOG OF BORING NO. 65-87

GEOLOGIST(S): TSD
DATE: 7/19/89

PROJECT NO: 6667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 3 ↑ 12.0	9.5 to 12.0	(1) 1.90				2.5cm-2.0mm =20% VCG =20% CG-MG =45% Fines =15%	SP	11		Gravelly sand moderate yellowish brown (10YR 5/4), angular to subrounded, poor to moderately graded, some clay + silt. Gradational change occurs in lower 1/3 of interval to a clayey medium to very fine grained sand yellowish gray (5Y 8/1) angular to subangular well graded some gravel.
12.0 ↓	12.0 to 14.5	(1) 1.52				3.0cm-2mm =15% VCG= 35% CG-MG =35% Fines =15%	SW	12, 13, 14		Gravelly clayey sand dark yellowish orange (10YR 6/6) + very pale orange (10YR 8/2), subangular to rounded, well graded, trace of silt.
Box 2 of 3	14.5 to 17.0	(1) 1.36					SW	15, 16, 17		Same as above with the color being only dark yellowish orange (10YR 6/6) + max gravel size = 5 cm.
	17.0 to 19.5	(1) 1.60					SW / CL	18, 19		1st 1/2 of interval is same as above. The 2nd 1/2 of interval consists of a sandy gravelly clay very light gray (N8) + grayish orange (10YR 7/4) medium to high plasticity trace of silt.
										See Next Page

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 65-87

GEOLOGIST(S): TSD
DATE: 7/19/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 3	10.5 to 22.0	(1) 2.17					CL	21		Sandy clay yellowish gray (5Y 7/2), medium to high plasticity, some gravel, trace of silt
Box 2 of 3	22.0 to 24.0	(2) 2.24					CL	22, 23		medium to fine sandy clay yellowish gray (5Y 7/2) medium to high plasticity, trace of silt + gravel. Sand occurs in lenses + pockets + is mostly fine clean sand.
24.4	24.0 to 24.4	(2) 0.32					CL	24		Clay light olive gray (5Y 6/1) high plasticity, trace of sand + silt
24.4 ↓ Box 3 of 3	24.4 to 25.0	(1) 0.9					CL			Same as above
Box 3 of 3	25.0 to 26.0	(1) 1.3					CL	25		Same as above
26.0								26		Bottom of boxes

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. G5-87

DATES DRILLED
ELEVATION
GEOLOGIST(S) TSD/DCB
DATE
CHECKED BY DATE 7/19/89

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE (in feet)	SAMPLE NUMBER	FEET OF CORE IN BOX (USCS symbol)	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 TO 2.0		1.7(1)	GC			9.5cm TO 2.0mm = 40% VCG TO FCG = 30% < FCG = 30%	1		Sandy clayey gravel medium gray (N5) subangular to subrounded moderately graded, clay color is dark yellowish brown (10YR 4/2)
	2.0 TO 4.0		1.75(1)	CL				2, 3		Gravelley clay yellowish gray (5Y 8/1) medium plasticity, some silt + sand.
	4.0 TO 7.0		~~2.00~~ ~~1.85~~ 2.40(1)	CL				4, 5, 6		Same as above
BOX 1 of 3	7.0 TO 9.5		1.25(1) ~~2.5~~ ~~2.00~~	GW		30cm TO 0.0mm = 65% VCG TO VFG = 30% & < VFG = 5%		7, 8, 9		Gravel light gray (N7) angular to well rounded, well graded some sand, trace of clay + silt.
										See Next pg.

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

BG - Background - 250 - 300 cpm
BG - core box 1 - 50 - 200 cpm
Core box 2 - 50 - 150 cpm
Core box 3 - 50 - 150 cpm

LOG OF BORING NO. 65-87

DATES DRILLED
ELEVATION
GEOLOGIST(S) TSO
DATE
CHECKED BY
DATE 7/19/88

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE (IN BOX)	SAMPLE NUMBER	FEET OF CORE IN BOX (INTERVAL)	USCS SYMBOL ~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
→ Box 1 of 3 12.0	9.5 TO 12.0		1.90 (1)	SP			25cm TO 2.0mm = 20% VCG = 20% C GTO M.G = 45% Fines = 15%	11		Gravelly Sand moderate yellowish brown (10YR 5/4), angular TO subrounded, poor TO moderately graded, some clay & silt Gradational change occures in lower 1/3 of interval TO a clayey medium TO very fine grained sand yellow 5Y gray (5Y 8/1) angular TO subangular well graded some gravel.
12.0 ↓	12.0 TO 14.5		1.52 (1)	SW			3.0cm TO 2mm = 15% VCG = 35% C GTO M.G = 50% Fines = 5%	12 13 14		Gravelly clayey sand dark yellowish orange (10YR 6/6) & very pale orange (10YR 8/2), Subangular TO rounded well graded, Trace of Silt.
	14.5 TO 17.0		1.36 (1)	SW				15 16		Same as above with the color being only dark yellowish orange (10YR 6/6) & max gravel size = 5cm.
Box 2 of 3	17.0 TO 19.5		1.60 (1)	SW CL				17 18 19		1st 1/2 of interval is Same as above. The 2nd 1/2 of interval consists of a sandy gravelly clay very light gray (N8) & grayish orange (10YR 7/4), medium TO high plasticity, Trace of Silt.
										See Next Pg

NOTES General: The USCS is modified for This log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

B

LOG OF BORING NO. 65-87

DATES DRILLED
ELEVATION
GEOLOGIST(S) TSD
DATE
CHECKED BY
DATE 7/19/89

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (interval)	SAMPLE NUMBER	FEET OF CORE IN BOX (interval)	USCS SYMBOL ~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
BOX 2 of 3	19.5 TO 22.0		2.17 (1)	CL					21		Sandy clay yellowish gray (5Y 7/2), medium to high plasticity, some gravel, trace of silt
	22.0 TO 24.0		2.24 (2)	CL					22, 23		Medium to fine sandy clay yellowish gray (5Y 7/2) medium to high plasticity, trace of silt & gravel. Sand occures in lenses & pockets & is mainly fine clean sand.
24.4	24.0 TO 24.4		0.32 (2)	CL					24		Clay light olive gray (5Y 6/1) high plasticity, trace of sand & silt.
24.4	24.4 TO 25.0		0.9 (1)	CL					25		Same as above
BOX 3 of 3	25.0 TO 26.0		1.3 (1)	CL							Same as above
26.0									26, 27, 28, 29		Bottom of boxes

NOTES General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 66-31

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 5/2/89
CHECKED BY:
DATE:

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (IN FEET)	SAMPLE NUMBER	FEET OF CORE (IN BOX)	USCS SYMBOL	FEET OF CORE IN ROW	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 to 2.0		(1) .6	CL				60% clay 40% Gravel	1, 2		Gravely Clay, dark yellowish brown (10 YR 4/2), moderate plasticity, some roots and part debris, some silt.
	2.0 to 4.0		N/D	GC				>50% Gravel	3, 4		Clayey Gravel, medium light gray (N6), clay matrix is moderate reddish brown (10 R 4/6), angular to subrounded, poorly graded some silt, clay matrix grades to light brown, (5 YR 6/4) and increases in volume below 3 ft.
	4.0 to 7.0		(1) .9	ML					5, 6		Gravelly, Sandy Silt, grayish orange (10 YR 7/4), trace of clay.
	7.0 to 10.0		0						7, 8, 9		No. Sample

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 66-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 8/2/89
CHECKED BY: DATE:

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE RECOVERED	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	10 to 12.0		ND	CL				>50% Clay	11		Gravelly Clay, moderately yellowish brown (10 YR 5/4), moderate plasticity, some silt, trace of sand, color grades to grayish orange (10 YR 7/4) below 11 ft.
	12.0 to 14.5	GS	ND	SP / CL				>50% Sand; ~33% Clay; ~33% Sand; ~33% Gravel	12, 13, 14		Sand, grayish orange (10 YR 7/4), moderately graded, angular to sub angular, med. to very fine grained, trace of silt and clay. Interval grades to a gravelly sand below 12.5 ft angular to subrounded, moderately graded, very coarse grained, to very fine grained.
	14.5 to 17.0		ND					>50% Clay	15, 16, 17		Below 13.5 ft. interval grades to a gravelly, sandy clay, grayish orange (10 YR 7/4), low plasticity. Clay, light gray (N7), high plasticity, trace of sand and silt.
	17.0 to 18.0	GS	(1) 1.6	SP				>50% Sand; >50% Clay	18		Sand, grayish orange (10 YR 7/4), subrounded to rounded, poorly graded, medium grained, very clean.
	18.0 to 19.0		(1) 1.5						19		Claystone, dark yellowish orange (10 YR 6/6) grading to yellowish gray (5 Y 8/1) with depth, bedding not apparent, highly weathered, highly to slightly friable, localized iron staining
	19.0 to 20.0	SL	ND								

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 66-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S):
DATE:
CHECKED BY: DATE:

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN INTERVAL	SAMPLE NUMBER	FEET OF CORE IN INTERVAL	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Core 3 ↑ 20.7	20.0										
	20.7										
	20.7-21.0										
	21.0								21		
									22		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 66-57

(Box 3/3 only - log was missing)

PAGE 1 OF 1

GEOLOGIST(S): [illegible]
DATE: 9/5/89

PROJECT NO: [illegible]

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
20.7	20.7 21.0	0.24						21		VFG SANDY CLAYSTONE, ~~very light gray~~ ~~and~~ green [illegible] massive bedding, well [illegible], moderately friable, [illegible] abundant [illegible] trace [illegible]
[illegible]	[illegible] -22.0	(1) 1.4								
	22.0 -23.0	(2) 1.3						22		Same as above flaming texture
23.0										Same as above consolidated texture
END OF BOXES								23		
								24		
								25		
								26		
								27		
								28		
								29		

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 67-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 8/2/89
CHECKED BY:
DATE:

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW	SAMPLE NUMBER	FEET OF CORE	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 to 0.5		ND	CL				750% clay			Gravelly Clay, dark yellowish brown (10 YR 4/2), moderate plasticity, some sand and silt.
	0.5 to 2.0		0	X				X	1	X	No Sample
	2.0 to 3.1		ND	GC				~50% clay ~50% Gravel	2 3		Clayey Gravel, medium light gray (N7), clay matrix is (10 R 3/4), angular to subangular, poorly graded, max size 7cm. some silt, trace of sand
	3.1 to 4.0		0	X				X		X	No Sample
	4.0 to 5.6		ND	GC				~50% clay ~50% Gravel	4 5		As above (reference interval 2.0 to 3.1 ft), matrix color grades to very pale orange (10 YR 8/2), max. gravel size is 6cm.
	5.6 to 6.0		0	X				X		X	No Sample
	6.0 to 6.9		ND	CL				750% clay	6		Gravelly Clay, very pale orange (10 YR 8/2), moderate plasticity, some silt and fine sand.
	6.9 to 8.0		0	X				X	7	X	No Sample
	8.0 to 9.6		ND	CL					8 9		As above (reference interval 6.0 to 6.9 ft.) color is grayish orange (10 YR 7/4). At 9 ft. interval grades to Clay, yellowish gray (5 Y 8/1), high plasticity some sand and silt.
	9.6 to 10.0		0	X				X		X	No Sample

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(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 67-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 8/2/89
CHECKED BY:
DATE:

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE	USCS SYMBOL	FEET OF CORE IN RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
DCB Box 1 of 1 ↑ 12.1	10.0 to 12.1		DCB ~~CL~~ ND	CL				~~>50% clay~~ DCB	>50% clay	11		As above (reference interval 9.0 to 9.6 ft).
12.1 ↓	12.1 to 14.1		ND	SW / CL					>50% sand / >50% clay	12 / 13		Sand, dark yellowish orange (10 YR 6/6), angular to subrounded, well graded, medium grained to very fine grained, trace of coarse grained sand and silt, 12.1 to 12.45 ft.
	14.1 to 15.4		ND	MH					>50% silt	14 / 15		Sandy Clay, mottled yellowish gray (5 Y 8/1) to grayish orange (10 YR 7/4), moderate plasticity, gradual increase in sand fraction to 14.1 ft. / silt, mottled yellowish gray (5 Y 8/1) to grayish orange (10 YR 7/4), trace of fine sand.
Box 2 of 2	15.4 to 16.1		0							16		No Sample
	16.1 to 17.0		ND DCB ~~0~~	~~Sand~~ DCB ~~MH~~ CL ~~Sand~~ DCB					>50% silt / >50% clay			As above (reference interval 14.1 to 15.4 ft) with some gravel. At 16.4 ft. interval grades to Clay, very light gray (N7), high plasticity.
	17.0 to 17.8		0 ~~0~~							17		No Sample
	17.8 to 18.8		(2) 1.7	CL					>50% clay	18		As above (reference interval from 16.4 to 17.8 ft) with local iron staining.
	18.8 to 19.8		(1) .6							19		
	19.8 to 21.4		ND									

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(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 67-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): DCB
DATE: 8/2/89
CHECKED BY:
DATE:

USCS symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX	FEET OF CORE IN ROW	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 2 of 2 ↑ 21.4	19.8 to 21.4		ND	CL			>50' clay	21		As above
								22		Bottom of Box 2 of 2 at 21.4

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 68-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD
DATE:
CHECKED BY:

USCS symbol

DATE: 8/1/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN ROW (INTERVAL)	SAMPLE NUMBER	FEET OF CORE (INCHES)	~~FEET OF CORE IN ROW~~	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 TO 1.8		ND	GC			75% is 72mm	1		sandy clayey gravel - dark reddish brown (10R 3/4) (clay matrix) subangular to subrounded mod. well graded, max size ≈ 5cm, some silt.
	1.8 TO 2.0	~~2~~ 2.0	0	–				2		grades into a gravelly clay moderate reddish brown (10R 4/6) to a moderate yellowish brown (10YR 5/4), est low plast, some sand
	2.0 TO 2.8		ND	CL						
	2.8 TO 4.0		0	–				3		No Sample
	4.0 TO 4.7		0.5 (1)	CL				4		Sandy Gravelly clay - grayish orange (10YR 7/4) - est. low plasticity, some silt, max gravel size = 3.5cm
	4.7 TO 6.0		0	–				5		No Sample
	6.0 TO 6.8		ND	CL				6		Same as above; max gravel size = 5cm
	6.8 TO 7.4		0	–				7		No Sample
	7.4 TO 8.0		0	–						
	8.0 TO 8.7		13 (1)	CL				8		same as above
	8.7 TO 9.8		0	–				9		No Sample

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 68-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSP
DATE:
CHECKED BY: USCS symbol
DATE: 8/1/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE RECOVERED	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
BOX 1 of 2	9.8 TO 11.8		2.6 (1)	CL					11		Top 1/2 of interval is a silty clay - grayish orange (10YR 7/4) med plast, some sand + iron staining as mottles, trace of gravel + carbonaceous staining bottom 1/2 of interval is a clayey sand & gravel - grayish orange (10YR 7/4), rounded to subrounded well graded, max size ≈ 6cm.
				SC/GC				>50% is >#4			
12.0	11.8 TO 12.0		0						12		NO SAMPLE
12.0 ↓	12.0 TO ~~13.0~~ 13.8		~~1.0~~	SC/GC				>50% is >#4			Same as above moderately graded.
	~~13.0~~ ~~TO~~ 14.0		1.2 (1) ~~0~~						13		
	14.0 TO 15.0		0						14		NO Sample
	15.0 TO 15.8		2.1	SC/GC CL					15		Same as above sub angular to subrounded. Bottom 4" is a silty clay - grayish orange (10YR 7/4) + very lt gray - mottled
	15.8 to 16		0						16		NO sample
BOX 2 of 2	16.0 TO 16.9		1.35 (1)	CL							Silty clay - dark yellowish orange (10YR 6/6) + lt olive gray (5Y 6/1) - mottled, some iron staining + carbonaceous staining
	16.9 TO 17.9		1.5 (2)	CL					17		Same as above - est med plast
	17.9 TO 19.0		1.35 (2)	CL					18		Same as above trace of fine sand in a lense 1/4 from bottom
↑ 20.0	20.0		0.6	CL					19		Same as above

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(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 67-87 A

GEOLOGIST(S): [illegible]
DATE: 8/4/16/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 -.05					60% CLAY 30% SAND 10% GRAVEL	CL			SANDY CLAY, dark yellowish brown (10 YR 4/2), mod plast., some gravel, some roots
	.05 -3.0					80% CLAY 20% SAND	CL	1 2		TOP 1.5 FT - Same as above, less sand content, trace gravel. Bottom 1.5 FT: Same as above, increased sand & gravel content, slightly calc. (moderate yellowish brown (10 YR 5/4))
Box 1 of 1	3.0 - 4.7					100% CLAY	CL	3 4		CLAY, dark yellowish orange (10 YR 6/6) and yellowish gray (5 Y 8/1), mod-low plast., trace of gravel, trace of roots, trace of carb material
↑ 6.7	4.7 -6.7					70% CLAY 30% SAND	CL	5 6		Same as above; Some sand
								7 8 9		

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 70-87

GEOLOGIST(S): DCB/TSD
DATE. 7/17/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION *	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 to 2.0	(1) 0.90				6.0-3.0 =20% 3.0-.2 =25% .2-Clay =35% Clay =20%	GC	1, 2		Gravel very light gray (N8) angular to subrounded, low sphericity, 4cm is max size, moderately well graded. Some clay + sand (moderate brown (5 YR 3/4))
	2.0 to 4.0	(1) 1.90				3.0-1.0 =40% 1.0-.2 =10% .2-Clay =25% Clay =25%	GC	3		Clayey Gravel very light gray (N8) angular to subrounded, low sphericity, 3.5 cm is max size, moderately well graded, clay is moderate brown (5 YR 3/4), some sand.
						3.0-1.0 =20%		4		Sandy Gravel medium light gray (N4) angular to subrounded, low to moderate sphericity, 3cm is max size, moderately graded, some clay.
Box 1 of 2	4.0 to 6.0	(1) 0.85				1.0-.2 =30% .2-Clay =35% Clay =15%	GW/GP	5		Same as above
	6.0 to 8.0	(1) 0.60				3.0-1.0 =15% 1.0-.2 =35% .2-Clay =35% Clay =15%	GW/GP	6, 7		Silty Gravel medium gray (N5) (grayish orange (10YR 7/4) - silt) angular to subangular low to moderate sphericity, 1.5cm is max size, well graded, some sand.
	8.0 to 10.0	0					GC	8, 9		No Sample

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

* Clay = 1/2048 — 1/256 mm

This log has been recopied to include correct graphic lithologic log. CKF

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 70-87

GEOLOGIST(S): DCB / TSD
DATE: 7/17/89

PROJECT NO: 667-11.20

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 2	10.0 to 12.0	(1) 0.35					CL	11, 12		Gravelly silty clay light gray (N7) high plasticity, gravel max size = 7cm + is dark gray (N3).
	12.0 to 14.0	(1) 2.70						13, 14		Silty clay - mottled very light gray (N8) + dark yellowish orange (10 YR 6/6), high plasticity, trace of fine sand.
↑ 16.0	14.0 to 16.0	(1) 1.90						15		Same as above
16.0 ↓ Box 2/2 ↑ 17.0	16.0 to 17.0	(1) 1.50						16, 17		Silty clay medium gray (N5) medium plasticity trace of fine sand.

NOTES: General: USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 70-87

DATES DRILLED
ELEVATION
GEOLOGIST(S) OCB/TSD USCS symbol
DATE
CHECKED BY DATE 7/17/87*

PROJECT NO. 667 11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN	SAMPLE NUMBER	FEET OF CORE IN BOX	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0 TO 2.0		0.80 (1)	GCW			6.0-3.0 20% / 3.0-.2 25% / .2-CLAY 35% / CLAY 20%	1		Gravel very light gray (N8) angular to subrounded, low sphericity, 4 cm is max. size, moderately well graded. Some clay & sand (Moderate brown (5YR 3/4)
	2.0 TO 4.0		1.80 (1)	GC			3.0-1.0 40% / 1.0-.2 10% / 2-CLAY 25% / CLAY 25% / 3.0-1.0 20% / 1.0-.2 30% / .2-CLAY 35% / CLAY 15%	2, 3		Clayey Gravel very light gray (N8) angular to subrounded, low sphericity, 3.5 cm is max size, moderately well graded, clay is moderate brown (5YR 3/4) some sand
Box 1 of 2	4.0 TO 6.0		0.85 (1)	GW/GP			11	4, 5		Sandy gravel medium light gray (N6) angular to subrounded, low to moderate sphericity, 3 cm is max size, moderatly graded, some clay.
	6.0 TO 8.0		0.60 (1)	GW/GP			3.0-1.0 15% / 1.0-.2 35% / .2-CLAY 35% / CLAY 15%	6, 7		Same as above
	8.0 TO 10.0		0	GC ~~GC~~ ~~GM~~			NS	8, 9		~~Clayey~~ Silty Gravel medium gray (N5) grayish orange (10YR 7/4) - Silt) angular to subangular, low to moderate sphericity, 1.5 cm is max size, well graded, some sand. No Sample

NOTES.

* CLAY 1/2048 - 1/256 mm

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 70-87

DATES DRILLED
ELEVATION
GEOLOGIST(S) DCL/TSD
DATE
CHECKED BY
USCS Symbol
DATE 7/17/89
PROJECT NO

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (Interval)	SAMPLE NUMBER	FEET OF CORE IN BOX (Interval)	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 2	10.0 TO 12.0		0.35 (1)	CL				11		Gravelly silty clay light gray (N7) high plasticity, gravel max size = 7cm & is dark gray (N3)
	12.0 TO 14.0		2.70 (1)					12, 13		Silty clay - mottled very light gray (N8) & dark yellowish orange (10YR 6/6), high plasticity, Trace of fine sand.
	14.0 TO 16.0		1.90 (1)					14, 15		Same as above
16.0	16.0 TO 17.0		1.50 (1)					16		Silty clay medium gray (N5) medium plasticity, trace of fine sand
17.0								17, 18, 19		
Box										

NOTES

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 71-87

GEOLOGIST(S): DCB/TSD
DATE: 7/17/89

PROJECT NO:

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION *	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 to 0.6	(1) 0.4				6.0-30 =60% 3.0-1.0 =20% Clay=20%	GP			Gravel - medium gray (N5) angular to sub-rounded, low sphericity, 4.5cm is max size, poorly graded, some clay grayish brown (5YR3/6) Trace of roots.
	0.6 to 2.0	(1) 0.66				6.0-30 =40% 3.0-6.0 =20% Clay =40%	GP	1		Same as above with an increase in clay fraction + roots.
	2.0 to 4.0	(1) 1.20				(cm)	SW/GW	2, 3		Fine to very coarse sandy gravelly caliche (calcareous cement) very light gray (N8) to dark gray (N3) sand + gravel is subrounded to rounded, moderate sphericity well graded, max size = 5cm.
	4.0 to 4.6	(1) 0.74					SW/GW	4		Same as above
	4.6 to 5.0	0					—			No Sample
	5.0 to 5.95	0					—	5		No Sample
	5.95 to 7.95	(1) 0.93				3.0-1.0 =40% 1.0-.2 =15% .2-.06 =20% Clay =25%	GW	6, 7		Clayey sandy gravel Dark yellowish orange (10YR 6/6) to grayish orange (10YR 7/4), subangular to rounded, low to moderate sphericity, 3cm is max size, well graded, some silt.
	7.95 to 9.0	0					—	8		No Sample
	9.0 to 10.6	(1) 1.83					CL	9		Fine to very coarse sandy clay mottled grayish orange (10YR 7/4) + very light gray (N8), low plasticity, trace of gravel.

Box 1 of 2

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible
(2) Core breaks cannot be matched, accurate footage measurements not possible.

* Clay = 1/2048 - 1/256 mm

This log has been re-copied to include correct graphic lithologic log. CKF

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 71-87

GEOLOGIST(S):
DATE:

PROJECT NO:

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
							CL			See Page 1
Box 1 of 2	10.6 to 11.0	0					–	11		No Sample
	11.0 to 12.6	(1) 1.82					CL	12		Same as previous description
↑ 13.0	12.6 to 13.0	0					–	13		No Sample
13.0 ↓	13.0 to 14.1	(1) 0.90					CL	14		Clay dark yellowish orange (10YR 6/6) moderate plasticity trace of fine to coarse gravel. Contains a mineralized iron nodule (siderite, limonite?) is ≈ 5cm in size
	14.1 to 15.0	0					–	15		No Sample
Box 2 of 2	15.0 to 16.1	(1) 0.77					CL	16		Clay very light gray (N8) highly plastic, trace of medium grained sand.
	16.1 to 17.0	0						17		No Sample
	17.0 to 17.6	(1) 1.00					CL			Same as previous sample
↑ 19.0	17.6 to 19.0	0						18 19		No Sample

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight
(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 71-87

DATES DRILLED
ELEVATION
GEOLOGIST(S) DCB/TSD
DATE
CHECKED BY DATE 7/17/89

PROJECT NO.

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (FT OF CORE)	SAMPLE NUMBER	FEET OF CORE IN RUN	USCS SYMBOL ~~FEET OF CORE IN RUN~~	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	* GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
00	0.0 TO 0.6		0.4 (1)	GP			60-30/60% 30-10/20% CLAY/20%			Gravel - Medium gray (N5) angular to subrounded, low sphericity, 4.5cm is max size, poorly graded, some clay grayish brown (5YR 3/2), Trace of roots.
	0.6 TO 2.0		0.66 (1)	GP			60-30/40% 30-10/20% CLAY/40%	1		Same as above with an increase in clay fraction + roots.
	2.0 TO 4.0		1.20 (1)	SW/GW			(CM)	2 3		Fine to very coarse sandy gravelly cliche (calcarious cement) very light gray (N8) to dark gray (N3) Sand & gravel is subrounded to rounded, moderate sphericity well graded, max size = 5cm.
	4.0 to 4.6		0.74 (1)	SW/GW				4		same as above
	4.6 to 5.0		0	—						No Sample
	5.0 TO 5.95		0	—				5		No Sample
BOX 1 of 4	5.95 TO 7.95		1.93 (1)	GW			30-10/40% 10-2/15% 2-.065/20% CLAY/25%	6 7		Clayey Sandy Gravel Dark yellowish Orange (10YR 6/6) to grayish orange (10YR 7/4), Subangular to rounded, low to moderate sphericity, 3cm is max size, well graded, some silt.
	7.95 TO 9.0		0	—				8		NO Sample
	9.0 TO 10.6		1.83 (1)	CI				9		Fine to very coarse sandy Clay mottled grayish orange (10YR 7/4) & very light gray (N8) low plasticity,

NOTES

* clay → 1/2048 - 1/256 mm

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 71-87

DATES DRILLED
ELEVATION
GEOLOGIST(S) DCO/TSD USCS Symbol
DATE
CHECKED BY DATE 7/17/89 PROJECT NO

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN	SAMPLE NUMBER	FEET OF CORE IN BOX	FEET OF CORE IN RUN	FRACTURES PER FOOT / FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
				CL						Trace of gravel.
BOX 1 of 2	10.6 TO 11.0		0	—						NO Sample
	11.0 TO 12.6		1.82 (1)	CL				11 12		Same as previous description
	12.6 TO 13.0		0	—						NO Sample
13.0 13.0	13.0 TO 14.1		0.90 (1)	CL				13 14		Clay dark yellowish orange (10YR 6/6) moderate plasticity Trace of fine to coarse gravel Contains a mineralize iron nodule (Siderite, limonite?) is ≈ 5cm in size.
	14.1 TO 15.0		0	—						NO Sample
	15.0 TO 16.1		0.77 (1)	CL				15 16		Clay very light gray (N8) highly plastic, trace of medium grained sand.
	16.1 TO 17.0		0							NO Sample
BOX 2 of 2	17.0 TO 17.6		1.00 (1)	CL				17		Same as previous sample
	17.6 TO 19.0		0					18		NO Sample
19.0								19		

NOTES

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 72-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSO
DATE:
CHECKED BY: DATE: 8/1/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN SIZE	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0 TO 2.0		(1) 0.93	GP/GW				75% 15 72mm	1		Calcareous Gravel - predominantly very light gray (N 8), angular to subrounded, mod. grading, max size = 6.5cm, some clay & roots at top 3" of interval, ~~Some~~ trace of sand.
	2.0 TO 3.5		(1) 0.9	GP/GW				75% 15 72mm	2, 3		same as above, except no clay & roots & increased sand fraction, max size = 6.5cm
	3.5 TO 4.0		0						4		NO Sample
	4.0 TO 6.0		(1) 0.2	GP/GW				75% 15 72mm	5		same as above max gravel size = 2.5cm, some silt
	6.0 TO 8.0		(1) 1.55	CL					6, 7		silty clay - grayish orange (10YR 7/4) to a pinkish gray (5YR 8/1) - low plast, some fine sand, trace of calcite in pockets
	8.0 TO 10.0		(1) 1.75						8, 9		Same as above

BOX 1 of 1

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 72-87

DATES DRILLED:
ELEVATION:
GEOLOGIST(S): TSD
DATE:
CHECKED BY:
DATE: 8/1/88
PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN RUN (INTERVAL)	SAMPLE NUMBER	FEET OF CORE	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Cut 1 of 1	10.0 TO 12.0		0	-					11		NO SAMPLE
	12.0 TO 13.0		0	-					12		
15.0	13.0 TO 15.0		0.3	CL					13, 14		Silty clay - grayish orange (10YR 7/4) to a pinkish gray (5YR 8/1) - low plast, some fine sand.
									15		BOTTOM OF BOX
									16		
									17		
									18		
									19		

NOTES: General: The USCS is modified for this log as follows: Material amounts are estimated by percent volume instead of percent weight.
(1) Badly broken core, accurate footage measurement not possible.
(2) Core breaks cannot be matched, accurate footage measurement not possible.

ROCKY FLATS PLANT

FIGURE NO.