

**Geologic
Characterization
Report

Appendix F

Volume I**

GEOLOGIC CHARACTERIZATION REPORT

For U.S. DOE-Rocky Flats Plant

 **EG&G ROCKY FLATS**

APPENDIX F

(VOL. 1)

July 31, 1991

ADMIN RECORD

GEOLOGIC CHARACTERIZATION REPORT

For U.S. DOE-Rocky Flats Plant



APPENDIX F

(VOL. 1)

July 31, 1991

REVIEWED FOR CLASSIFICATION/UCRL

By

[Signature]
Date 12/16/91

VISUAL GEOLOGIC LOGGING PROTOCOL FOR THE GEOLOGIC CHARACTERIZATION OF THE ROCKY FLATS PLANT

1. INTRODUCTION

The visual geologic logging protocol described herein provides a format and guidelines for the concise, rigorous and consistent logging/description of both unconsolidated materials and rock core. These protocols are intended for use under controlled field conditions and rely primarily on visual inspection and physical manipulation of the core including slabbing the core with a bandsaw. The core logs will be used to characterize the geologic media that compose the aquifer(s) beneath the Rocky Flats plant. Additionally, the logs will serve as a standard against which other core logs may be compared.

2.0 PROCEDURES FOR EVALUATING CORE LOSSES

Determine the top and bottom of each run. Examine the core within an individual run and match any breaks to allow for accurate measurement. Measure the "unadjusted" total length of the run to the nearest tenth of a foot. The unadjusted total length does not account for unrecovered core, ground core, cavities or sections removed for laboratory analysis. Review the core loss footage and sample footage recorded on each box and sum the total losses for the run. Sum the unadjusted total length and the total losses and compare this figure with the total footage of the run recorded on the boxes. Note and discrepancies and show all calculations on the notes section of Figure 2-1.

3.0 SOIL SAMPLE DESCRIPTIONS

Descriptions for soil will be in accordance with the Unified Soil Classification System (USCS). The USCS is designed so that most soils can easily be classified into the three primary groups (coarse-grained, fine-grained, and highly organic) by means of visual inspection and simple field tests.

The field classification procedure consists of a process of elimination and occurs by moving from left to right in Figure 3-1a until the proper group name is obtained. The general procedure followed is described as follows: (1) Obtain a representative sample of the soil; (2) Estimate the size of the largest particle; (3) Remove the boulders and cobbles and estimate the amount (percentage by weight) represented by this fraction in the total sample; (4) Spread the dry sample on a flat surface or in the palm of the hand, and classify as

LOG OF BORING NO. _____

PAGE _____ OF _____

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
									1		
									2		
									3		
									4		
									5		
									6		
									7		
									8		
									9		

NOTES:



ROCKY FLATS PLANT

FIGURE NO. 2 -

Figure 3-1a. Unified Soil Classification System, Field Identification Procedures

Group symbols	Typical names	Information required for describing soils	First identification procedure (Excluding particles larger than 75 mm and bearing fractions on estimated weights)			Field identification procedure (The No. 200 sieve size is about the smallest particle visible to the naked eye)			FINE GRAINED SOILS More than half of material is smaller than No. 200 sieve size (The No. 200 sieve size is about the smallest particle visible to the naked eye)			COARSE GRAINED SOILS More than half of material is larger than No. 200 sieve size (For usual classifications, the 6 mm size may be used as equivalent to the No. 4 sieve size.)		
			Wide range in grain size and substantial amounts of all intermediate particle sizes	Predominantly one size or a range of sizes with some intermediate size missing	Nonplastic fines (for identification procedures see ML below)	Plastic fines (for identification procedures see CL below)	CLEAN GRAVELS (Little or no fines)	GRAVELS WITH FINES (Applicable amount of fines)	CLEAN SANDS (Little or no fines)	SANDS WITH FINES (Applicable amount of fines)	More than half of coarse fraction is smaller than No. 4 sieve size	More than half of coarse fraction is larger than No. 4 sieve size	More than half of material is smaller than No. 200 sieve size	SILTS AND CLAYS Liquid limit less than 50	SILTS AND CLAYS Liquid limit greater than 50
DW	Well-graded gravel, gravel-sand mixtures.	One typical name, plastic appearance, gradation of sand and gravel mixtures, angularity, surface condition and texture.	Wide range in grain size and substantial amounts of all intermediate particle sizes	Predominantly one size or a range of sizes with some intermediate size missing	Nonplastic fines (for identification procedures see ML below)	Plastic fines (for identification procedures see CL below)	Wide range in grain size and substantial amounts of all intermediate particle sizes	Predominantly one size or a range of sizes with some intermediate size missing	Nonplastic fines (for identification procedures see ML below)	Plastic fines (for identification procedures see CL below)	More than half of coarse fraction is smaller than No. 4 sieve size	More than half of coarse fraction is larger than No. 4 sieve size	ML	Inorganic silts and very fine sands with slight plasticity or clayey fine sands with slight plasticity
DP	Foamy graded gravel, gravel-sand mixtures; little or no fines.	One typical name, plastic appearance, gradation of sand and gravel mixtures, angularity, surface condition and texture.	Predominantly one size or a range of sizes with some intermediate size missing	Predominantly one size or a range of sizes with some intermediate size missing	Nonplastic fines (for identification procedures see ML below)	Plastic fines (for identification procedures see CL below)	Wide range in grain size and substantial amounts of all intermediate particle sizes	Predominantly one size or a range of sizes with some intermediate size missing	Nonplastic fines (for identification procedures see ML below)	Plastic fines (for identification procedures see CL below)	More than half of coarse fraction is smaller than No. 4 sieve size	More than half of coarse fraction is larger than No. 4 sieve size	CL	Inorganic silts and organic silts with slight plasticity
DM	Silty gravel, poorly graded gravel-sand.	For undisturbed soils add information on gradation, degree of compaction, moisture, moisture conditions, and drainage characteristics	Wide range in grain size and substantial amounts of all intermediate particle sizes	Predominantly one size or a range of sizes with some intermediate size missing	Nonplastic fines (for identification procedures see ML below)	Plastic fines (for identification procedures see CL below)	Wide range in grain size and substantial amounts of all intermediate particle sizes	Predominantly one size or a range of sizes with some intermediate size missing	Nonplastic fines (for identification procedures see ML below)	Plastic fines (for identification procedures see CL below)	More than half of coarse fraction is smaller than No. 4 sieve size	More than half of coarse fraction is larger than No. 4 sieve size	CH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
SW	Well-graded sands, gravelly sands; little or no fines.	For undisturbed soils add information on gradation, moisture conditions, and drainage characteristics	Wide range in grain size and substantial amounts of all intermediate particle sizes	Predominantly one size or a range of sizes with some intermediate size missing	Nonplastic fines (for identification procedures see ML below)	Plastic fines (for identification procedures see CL below)	Wide range in grain size and substantial amounts of all intermediate particle sizes	Predominantly one size or a range of sizes with some intermediate size missing	Nonplastic fines (for identification procedures see ML below)	Plastic fines (for identification procedures see CL below)	More than half of coarse fraction is smaller than No. 4 sieve size	More than half of coarse fraction is larger than No. 4 sieve size	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
SP	Foamy graded sands, gravelly sands; little or no fines.	One typical name, plastic appearance, gradation of sand and gravel mixtures, angularity, surface condition and texture.	Predominantly one size or a range of sizes with some intermediate size missing	Predominantly one size or a range of sizes with some intermediate size missing	Nonplastic fines (for identification procedures see ML below)	Plastic fines (for identification procedures see CL below)	Wide range in grain size and substantial amounts of all intermediate particle sizes	Predominantly one size or a range of sizes with some intermediate size missing	Nonplastic fines (for identification procedures see ML below)	Plastic fines (for identification procedures see CL below)	More than half of coarse fraction is smaller than No. 4 sieve size	More than half of coarse fraction is larger than No. 4 sieve size	OH	(Organic) silts and clays of medium to high plasticity
SM	Silty sands, poorly graded sand-silt mixtures	One typical name, plastic appearance, gradation of sand and gravel mixtures, angularity, surface condition and texture.	Wide range in grain size and substantial amounts of all intermediate particle sizes	Predominantly one size or a range of sizes with some intermediate size missing	Nonplastic fines (for identification procedures see ML below)	Plastic fines (for identification procedures see CL below)	Wide range in grain size and substantial amounts of all intermediate particle sizes	Predominantly one size or a range of sizes with some intermediate size missing	Nonplastic fines (for identification procedures see ML below)	Plastic fines (for identification procedures see CL below)	More than half of coarse fraction is smaller than No. 4 sieve size	More than half of coarse fraction is larger than No. 4 sieve size	CM	Inorganic silts and clays of high plasticity, fat clays
SC	Clayey sands, poorly graded sand-clay mixtures	One typical name, plastic appearance, gradation of sand and gravel mixtures, angularity, surface condition and texture.	Wide range in grain size and substantial amounts of all intermediate particle sizes	Predominantly one size or a range of sizes with some intermediate size missing	Nonplastic fines (for identification procedures see ML below)	Plastic fines (for identification procedures see CL below)	Wide range in grain size and substantial amounts of all intermediate particle sizes	Predominantly one size or a range of sizes with some intermediate size missing	Nonplastic fines (for identification procedures see ML below)	Plastic fines (for identification procedures see CL below)	More than half of coarse fraction is smaller than No. 4 sieve size	More than half of coarse fraction is larger than No. 4 sieve size	PH	Fat and other highly organic soils

Laboratory classification criteria		
<p>Use grain-size curve in identifying the fractions as given under field identification</p> <p>Determine percentages of gravel and sand from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:</p> <p>Less than 5 percent GW, GP, SW, SP. More than 12 percent GM, GC, SM, SC. 5 to 12 percent <u>Borderline cases requiring use of dual symbols.</u></p>	$C_c = \frac{D_{60}}{D_{10}}$ Greater than 4 $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3	
	Not meeting all gradation requirements for GW	
	Atterberg limits below "A" line, or I_p less than 4	Above "A" line with I_p between 4 and 7 are <u>borderline cases</u> requiring use of dual symbols.
	Atterberg limits above "A" line with I_p greater than 7	
	$C_c = \frac{D_{60}}{D_{10}}$ Greater than 6 $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3	
	Not meeting all gradation requirements for SW	
	Atterberg limits below "A" line or I_p less than 4	Above "A" line with I_p between 4 and 7 are <u>borderline cases</u> requiring use of dual symbols.
	Atterberg limits above "A" line with I_p greater than 7	

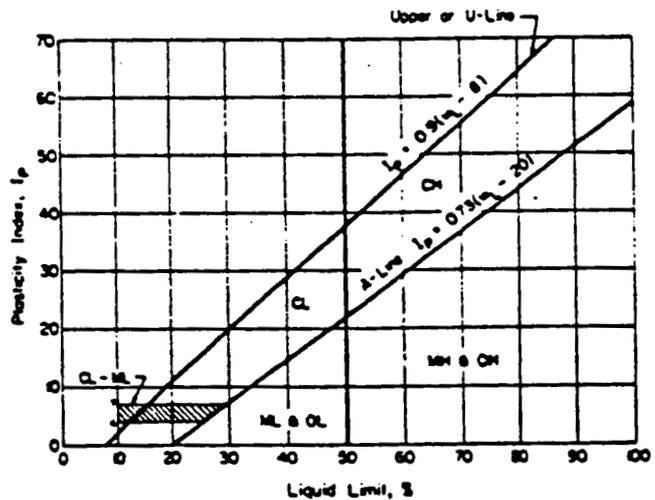


Figure 3-1b. Unified Soil Classification System, Grain Size Curve and Plasticity Index

coarse-grained or fine-grained according to the criteria in Figure 3-1a; (5) If coarse-grained, classify as gravel or sand by criteria in Table 3-1a; (6) If gravel or sand, classify as "clean" or "with appreciable fines" where fines are the fraction smaller than 0.074 mm (No. 200 sieve); (7) If the gravel or sand is clean, decide if it is well-graded (W) or poorly-graded (P), and assign the appropriate group name (GW, GP, SW, or SP); (8) If the gravel or sand contains appreciable fines, decide if the fines are silty (M) or clayey (C), and classify as GM, GC, SM, or SC; (9) for fine-grained soils or the fine-grained portion of a coarse-grained soil, the dilatancy (reaction to shaking), the dry strength (crushing characteristics), and plasticity (consistency near plastic limit) are performed; (10) Highly organic soils (Pt) are characterized by undecayed particles of leaves, sticks, grass, and other vegetative matter giving the soil a fibrous texture; and (11) Soils which have characteristics of two groups are given boundary classification using a name most nearly describing the soil, and the two group symbols are listed such as GW-GC.

Although the use of letter symbols is convenient, it does not describe a soil as completely as is normally required. Therefore, descriptive terms should be used and arranged in narrative form in addition to the letter symbols to produce a more complete soil classification. Such descriptions differ between coarse-grained and fine-grained soils and are shown below with examples.

For Coarse-grained soils: Give the typical name and color, color is described with respect to the GSA color chart; indicate approximate percentages of sand and gravel, maximum size; angularity, surface condition, and hardness of the coarse grains; local or geologic name if known and information on stratification, degree of compactness, cementation, moisture conditions (Reference Table 3-3) and add the appropriate USCS soil symbol in parenthesis.

Example: Silty sand, light brown (GSA color designation), gravelly, gray (GSA color designation), about 20% hard, angular gravel particles 1/2 inch maximum size; rounded and sub-angular sand grains coarse to fine; about 15% non-plastic fines with low dry strength;

TABLE 3-3

RELATIVE MOISTURE CONTENT OF SOILS

Term	Relative Moisture	
	Cohesive Soil	Cohesionless Soil
Negligible Moisture	Powdery	Not moist to the touch
Slightly Moist	Moisture content below plastic limit	Sample is moist to the touch
Moist	Moisture content above plastic limit but below liquid limit	Between dry and wet
Wet	Moisture content above liquid limit	Free water drips from the sample

TABLE 3-4

RELATIVE CONSISTENCY OF SOILS

Consistency (1)	q_u (Tsf) ^(a) (2)	Rule-of-Thumb (3)
Very soft	0.25 (0.5 KSF)	Core (Height = twice diameter) sags under own weight
Soft	0.25 - 0.50 (0.5-1.0 KSF)	Can be easily pinched in two between thumb and forefinger
Firm (medium stiff)	0.50 - 1.00 (1.0-2.0 KSF)	Can be imprinted easily with fingers
Stiff	1.00 - 2.00 (2.0-4.0 KSF)	Can be imprinted with considerable pressure from fingers
Very Stiff	2.00 - 4.00 (4.0-8.0 KSF)	Barely can be imprinted by pressure from fingers
Hard	Over 4.00 (8.0 KSF)	Cannot be imprinted by fingers

^(a) q_u is unconfined compressive strength in tons/sq. ft.

NOTE: The rules-of-thumb and the results of the penetration test given in Columns 3 and 4 are used only to determine the consistency of soils as described by the terms in Column 1. The values in Column 2, unconfined compressive strength, are given only to serve as a means of checking the field methods against laboratory methods. A pocket penetrometer would provide a quick approximation of the actual unconfined compressive strength. The values from Column 2 should not be used for design purposes without laboratory verification.

well compacted and moist in places; alluvial sand; gradational stratification, white calcium carbonate cement (reacts with dilute HCl); (SM).

For Fine-grained soils: Give typical name, indicate degree and character of plasticity, amount and maximum size of coarse grains, color with respect to the GSA color chart, odor if any, local or geologic name if known, information on structure, stratification, consistency, (Reference Table 3-4) moisture content and USCS soil symbol in parenthesis.

Example: Clayey silt, brown (GSA color designation); slightly plastic, small percentage of fine sand, numerous vertical root holes, firm and dry, loess, slightly moist; (ML).

4.0 FIELD DETERMINATIONS

4.1 Plasticity

Examination of the plasticity characteristics of fine-grained soils or of the fine fraction of coarse-grained soils is made with a small moist sample of the material. Particles larger than about the No. 40 sieve size are removed (by hand) and a specimen of soil about the size of a 1/2-in. cube is molded to the consistency of putty. If the soil is too dry, water must be added and if it is sticky, the specimen should be spread out in a thin layer and allowed to lose some moisture by evaporation. The sample is rolled by hand on a smooth surface or between the palms into a thread about 1/8 in. in diameter. The thread is then folded and rerolled repeatedly. During this manipulation the moisture content is gradually reduced and the specimen stiffens, finally loses its plasticity, and crumbles when the plastic limit is reached. After the thread crumbles, the pieces should be lumped together and a slight kneading action continued until the lump crumbles. The higher the position of a soil above the "A" line on the plasticity chart, (Table 3-1B) (CL, CH), the stiffer are the threads as their water content approaches the plastic limit and the tougher are the lumps as the soil is remolded after rolling. Soils slightly above

the "A" line (CL, CH) form a medium tough thread (easy to roll) as the plastic limit is approached but when the threads are formed into a lump and kneaded below the plastic limit, the soil crumbles readily. Soils below the "A" line (ML, MH, OL, OH) form a weak thread and, with the exception of the OH soils, cannot be lumped together into a coherent mass below the plastic limit. Plastic soils containing organic material or much mica (well below the "A" line) form threads that are very soft and spongy near the plastic limit. The binder fraction of coarse-grained soils may be examined in the same manner as fine-grained soils. In general, the binder fraction of coarse-grained soils with silty fines (GM, SM) will exhibit plasticity characteristics similar to the ML soils, and that of coarse grained soils with clayey fines (GC, SC) will be similar to the CL soils.

4.2 Dilatancy

After removing particles larger than the No. 40 sieve size, prepare a pat of moist soil with a volume of about one-half cubic inch. Add enough water as necessary to make the soil soft, but not sticky. Place the pat in the open palm of one hand and shake horizontally, striking vigorously against the hand several times. A reaction to shaking (dilatancy) consists of (1) the appearance of water on the surfaces of the pat which changes to a livery consistency and becomes glossy, and (2) when the sample is squeezed between the finger, the water and gloss disappear from the surface, the pat stiffens, and finally it cracks or crumbles. A rapid reaction indicates a nonplastic silt; a slow reaction means an organic silt, slightly clayey silt, or possibly a non-plastic silt with a very high liquid limit (over 50). Very fine clean sands give the quickest and most distinct reaction whereas a plastic clay has no reaction. Inorganic silts, such as typical rock flour, show a moderately quick reaction. No reaction indicates a clay or silty clay. To be decisive the test should be conducted at varying moisture contents.

4.3 Dry Strength

After removing particles larger than No. 40 sieve size, mold a pat of soil to the consistency of putty, adding water, if necessary. Allow the pat to dry completely by sun or air drying, and then test its strength by breaking and crumbling between the fingers. This strength is a measure of the character and quantity of the colloidal fraction contained in the soil. The dry strength increases with increasing plasticity.

High dry strength is characteristic for clays of the CH group. A typical inorganic silt possesses only a very slight dry strength. Silty fine sand and silt have about the same slight dry strength, but can be distinguished by their feel when powdering the dried specimen. Fine sand feels gritty whereas a typical silt has the smooth feel of flour.

5.0 ROCK SAMPLE DESCRIPTIONS

5.1 The systematic description of rock core will be based on methods described by Compton 1962. The order of descriptive terms is as follows:

Primary rock type

Secondary rock type

Color on fresh and weathered surfaces (wetted core only)

Friability

Grain sizes

Grain orientation

Nature and amount of cement or matrix

Nature of contacts

5.2 The preferred method of describing these features is given below.

Primary and secondary rock types are described with respect to lithic composition. The color of each is listed.

Color designations will conform with the GSA Rock Color Chart. The major color is given first with any accessory colors thereafter.

Friability is described with respect to weathering and induration using the modifiers highly, moderately, slightly and non-friable (see Table 5-1 for field application guidelines).

Grain sizes are given as a range of sizes followed by identification of the median grain size. Grain size charts will be referred to in the field to ensure consistent logging.

Grain composition is described with respect to mineralogy or lithic components. The approximate percent by volume will be estimated on the basis of Figure 5-1.

Degree of sorting will be determined by examining freshly broken surfaces both parallel and at right angles to the bedding. For detrital materials, an estimate of the range of grain sizes that includes the great bulk (80 percent) will be made. For sandstones, a sand-size card will be used to assist in determining the degree of sorting. The terminology used for the degree of sorting will be in accordance with Compton 1962 as shown on Figure 5-2.

Grain shapes will be identified through the use of a hand lens and will be described in terms of the degree of rounding. Figure 5-2b will be referred to in the field for comparison and proper use of terminology.

Platy and/or linear grains will be described according to their orientation in relation to bedding or rock structure

The nature and amount of cement or matrix will be identified through the use of a hand lens and hydrochloric acid.

The nature of contacts will be described as gradational or sharp, with descriptions and dimensions of gradations. If evidence regarding unconformities is present, this will also be described. Bedding and structural characteristics (e.g. slickensides, dewatering structures, etc.) will be noted and described.

Any additional observations or descriptors that help to describe the internal structures will be noted.

TABLE 5-1
RELATIVE FRIABILITY - FIELD CRITERIA

Term	Criteria
Highly Friable	Sample breaks down into its component grains under its own weight or upon removal from the core box.
Moderately Friable	Sample can be broken into its component grains by vigorous squeezing with the thumb and index finger.
Slightly Friable	Sample can be broken into its component grains by scraping its surface with a pocket knife.
Non-Friable	Sample cannot be broken into its component grains by any of the above techniques.

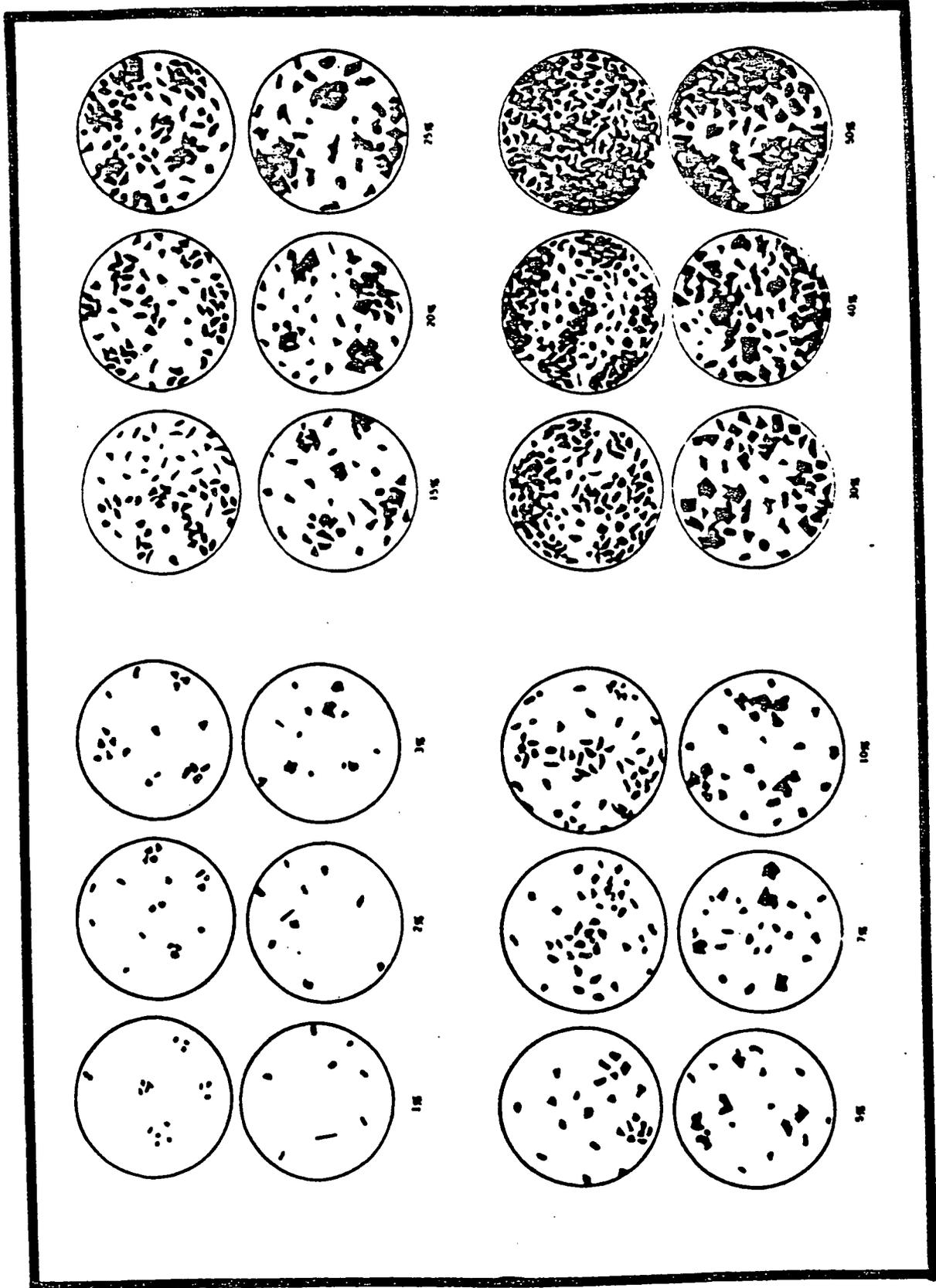
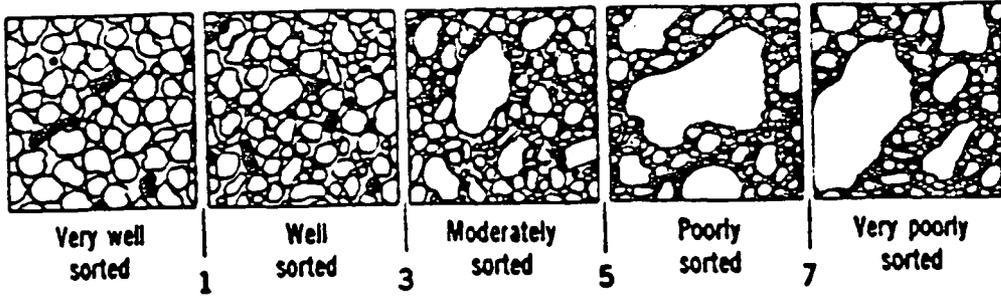


Figure 5-1. Grain Distribution Percentages (After R.R. Compton, 1962)

5-2a Sorting



5-2b Sphericity

SPHERICITY
 0.3 LOW
 0.5 & 0.7 MODERATE
 0.9 HIGH

ROUNDNESS
 0.1 ANGULAR
 0.3 SUBANGULAR
 0.5 SUBROUNDED
 0.7 ROUNDED
 0.9 WELL ROUNDED

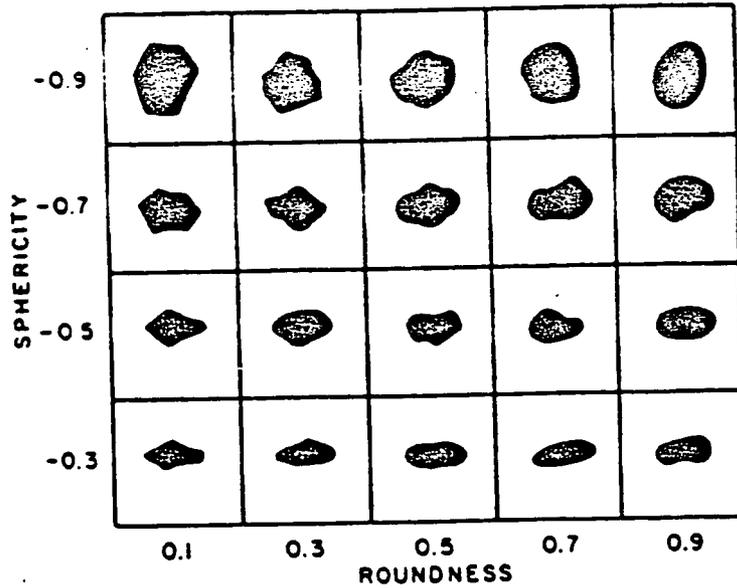


Figure 5-2a + b. Terms for Sorting and Sphericity (After R.R. Compton, 1962 and R.G. Swanson, 1981)

5.3 Quantitative Logging

In addition to recording core losses (section 2.0) and describing the core, quantitative measurements will be made and logged. Bedding thickness and maximum angle will be recorded. Fracture frequency per foot and maximum angle will be recorded and the character of the fracture will be described as either 1) open-stained, 2) open mineralized, or 3) sealed. A lithologic log utilizing symbols (reference Figures 5-3 and 5-4) for sedimentary structures and post depositional features will be prepared. The lithologic log will correlate lithologic descriptions to depth and other quantitative measurements.

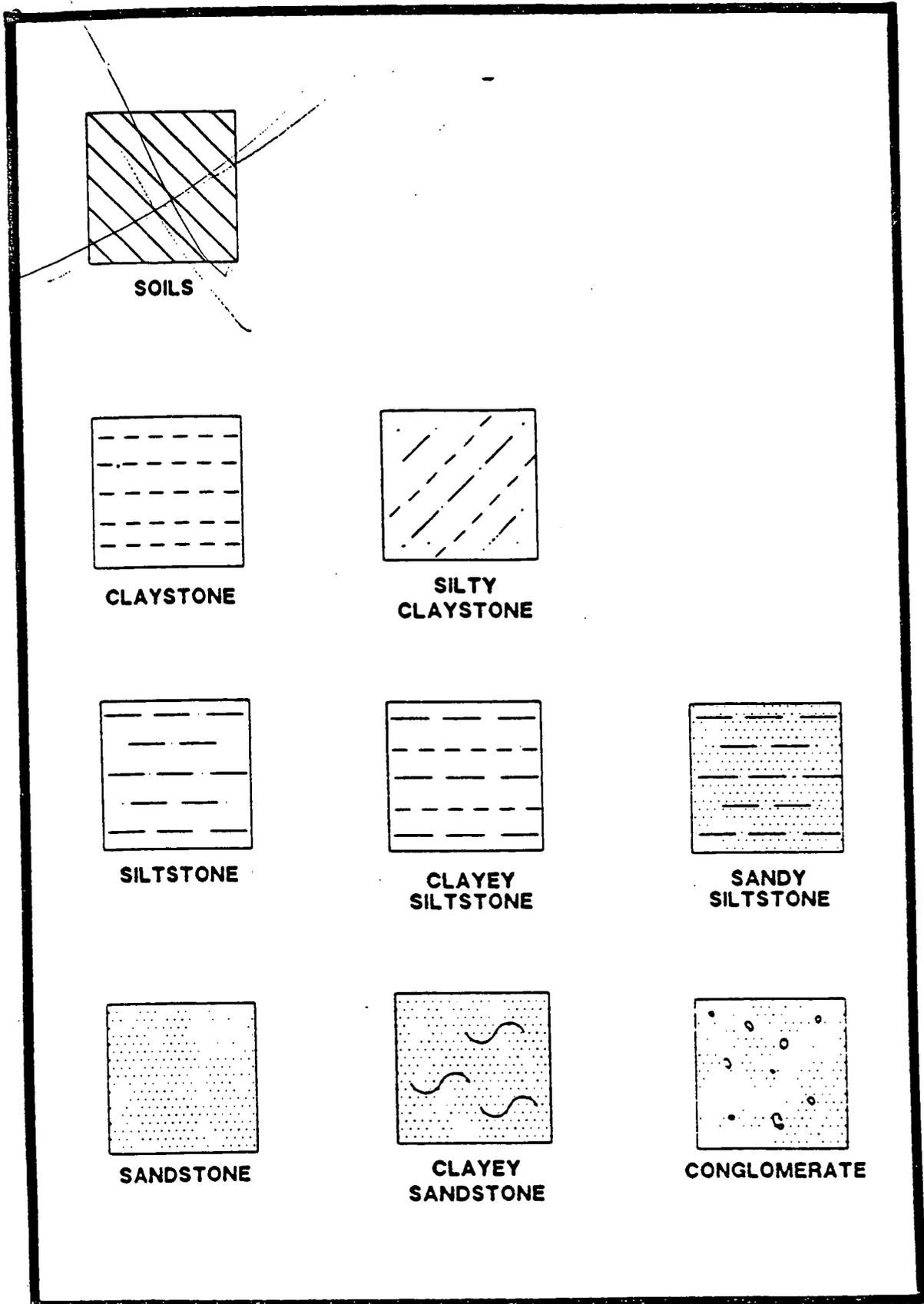


Figure 5-3. Symbols for Lithologic Textures

<u>STRUCTURES AND MARKINGS</u>	<u>SYMBOLS</u>
<u>Current Produced Markings</u>	
1. Ripple marks	~
2. Flame structures	|
3. Scour and fill	X
<u>Organism Produced Markings</u>	
1. Burrows - horizontal	O
2. Burrows - vertical	O
3. Bioturbated	X
4. Plant root tubes	X
<u>Penecontemporaneous Deformation Structures</u>	
1. Mud cracks	~
2. Slump structures	2
3. Load cast	h
<u>Tectonic Structures</u>	
1. Fractures	~
a. open	|
b. open stained	~
c. healed	~
2. Slickensides	~
3. Breccia	◇

Figure 5-4. Symbols for Sedimentary and Secondary Structures

REFERENCES

- 1) Compton, R.R., 1962 - Manual of Field Geology; John Wiley & Sons, Inc.
- 2) Swanson, R.G., 1981 - Sample Examination Manual; The American Association of Petroleum Geologists.
- 3) Rock Color Committee, 1948 - Rock Color Chart; Geologic Society of America.
- 4) U.S. Army Corps of Engineers, 1953 - Unified Soil Classification System; Office of the Chief of Engineers, Waterways Experiment Station, Vicksburg, Mississippi.

LOG OF BORING NO. 1-86

GEOLOGIST(S): *WJ*
 DATE: 3/24/89

PROJECT

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE OF INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCR
0.0	0.0 - 6.7							1 2 3 4 5 6	X	NO SAMPLE
6.7	6.7 - 8.0		ND					7	---	<p>Sandy clay, dark yellowish (10 YR 4/2), med plant, ...</p> <p>Bottom 3 in of interval: clay color is greyish ... angular, subangular, med-w ...</p>
8.0	8.0 - 9.0		∅					8	X	<p>Sample removed Aug 15 Ward Host. Sample Chem & Ass</p>
9.0	9.0 - 11.9	(1) 4.3						9	---	<p>CLAY (possibly well weathered) top 2 ft is yellowish grey 2 ft is greyish orange plant, bottom of interval</p>

Top 1 FT 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

LOG OF BORING NO. 1-86

PAGE 2 OF 2

GEOLOGIST(S): *MS*
 DATE: *8/24/89*

PROJECT NO: *667-11.27*

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
<i>Box 1 of 2</i>								11	---	<p><i>Sand, some calc. material, some iron staining (as mentioned)</i></p>
<i>↑ 11.9</i>							12	---		
<i>Box 2 of 2</i>	<i>11.9</i>	<i>-13.3</i>	<i>1.4</i>					13	---	<p><i>Clay (or possibly well weathered claystone), yellowish grey (5 YR 8/1), mod-high plast, some calc. material, some iron staining as mentioned, some s-cl</i></p>
<i>↓ 13.3</i>							14	---		
<i>END OF BOXES</i>								15	---	
								16	---	
								17	---	
								18	---	
								19	---	

erase (11)

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. 1-86A

PAGE 1 OF 1

(this ^{core} was in Box marked as 1-86 Box 1 of 2)

GEOLOGIST(S): *lls*

DATE: 8/24/89

PROJECT NO: 147-11.22

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 -1.0	(1) 0.7						1	[Hand-drawn lithologic log symbol]	SAND SANDY CLAY, chunky yellowish brown (10YR 2/2), med-high plast, trace of gravel, trace of calc material.
Box 1 of 2 in 1-86	1.0 -2.5							2	[X]	Sample removed 8/13/86 by Ward Hirst, Sample sent to Chen & Ass.
	2.5-3.0							3	[X]	NO SAMPLE
3.0								4		END OF SAMPLES
								5		
								6		
								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. 2-86A

PAGE 1 OF 7

GEOLOGIST(S): *Day*
 DATE: *8/24/87*

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 1 of 5	0.0 - 1.5	(1) 1.0				30% SAND 70% CLAY		1	---	Top 3 in: SANDY CLAY, dark yellowish brown (10 YR 4/2), mod. poor plast. some roots, trace of gravel. Soil is FS-MG. Bottom of interval: Same as above, v. pale gray (10 YR 8/2), highly calcareous, some gravel.
	1.5 - 3.0	∅						2	X	NO SAMPLE
	3.0 - 8.0	(1) 3.2						3	---	Top 1.5 ft. is 50% is CLAY, light gray (NF), est. mod. plast, other 50% possibly CALICHE, white (N9) <u>interbedded</u> some iron staining as mottles throughout. Bottom of interval: CALCAREOUS CLAY, light gray (NF) grading to moderate yellowish brown (10 YR 8/2) at base of interval, est. mod. plast. Some iron staining, flaky texture.
	8.0 - 13.0	(1) 1.4						4	---	
							5	---		
								6	---	
								7	---	
								8	---	Same as above: yellowish brown (10 YR 5/4) grading to light gray (NF) at base of interval, is slightly calc.
								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. 2-86A

PAGE 2 OF 7

GEOLOGIST(S): *MS*

DATE: *8/24/87*

PROJECT NO: *227-11-11*

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
<i>Box 1 of 5</i>								11	---	<i>See previous page</i>
								12	---	
	<i>13.0 -14.9</i>		<i>(1) 1.4</i>					13	---	<i>Clay, light gray (N7), cat med plast., some iron staining, flaky texture</i>
<i>↑ 14.9</i>								14	---	
<i>↓ 14.9</i>	<i>14.9 -18.0</i>							15	---	<i>Same as above: some ^{light olive gray (5 Y 6/1)} med material, trace of calc. material, fairly coarse texture</i>
								16	---	
<i>Box 2 of 5</i>								17	---	<i>Same as above</i>
								18	---	
	<i>18.0 -23.0</i>							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. 2-86A

PAGE 3 OF 7

GEOLOGIST(S): *Ray*
 DATE: 5/24/69

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 5								21	---	See previous page	
								22	---		
		23.0 -272						23	---		CLAY, <i>di</i> ve gray (5 Y 4/1) mod plast, <i>See non staining, flamy texture</i>
								24	---		
								25	---		
								26	---		
								27	---		<i>See as above, some VFG-FG sand</i>
		27.2 -280	1.4					28	---		<i>See as above: grayish orange (10 YR 7/4)</i>
		28.0 -330	1.2					29	---		
	Box 5 of 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. 2-86A

GEOLOGIST(S): *DAJ*
 DATE: *8/24/89*

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
								31		
								32		
	33.0 - 35.5	1.2						33		Clay, moderate yellowish brown (10 1/2 5/4), mod plast, some iron staining along fracture planes, flowy texture.
								34		
	35.5 - 38.0	1.4						35		Same as above
								36		
								37		
	38.0 - 40.5	1.3						38		Same as above: abundant iron staining at base of interval.
								39		

Box 3 of 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. 2-86 A

PAGE 5 OF 7

GEOLOGIST(S): *das*
 DATE: *8/24/92*

PROJECT NO: *67-11-22*

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
↑ 40.5									---	See previous page
	40.5 - 43.0	(1) 1.3						41 42	---	CLAY, yellowish grey (S Y B/I), mod plast., trace of iron staining
	43.0 - 45.5	(1) 1.4						43 44 45	---	Same as above
Box # of 5	45.5 - 50.0	(2) 3.1		45° 50° 65° 70°				46 47 48 49	---	CLAYSTONE, pinkish grey (S Y B/I) massive bedding, highly weathered mod-poorly friable, some iron staining fractures at 45°, 50°, 65°, 70°, some iron staining filling fractures trace of Mg staining as dendritic pattern, 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. Z-86A

GEOLOGIST(S): *WJ*
 DATE: 8/24/89

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
<i>Box 5 of 5</i>	50.0 - 53.0	(2) 1.6						51		CLAYSTONE, pinkish gray (S 1/2 B 1), massive bedded, highly weathered, mod-poorly friable, highly fractured with staining esp. along fracture joints, trace of Mg staining. Some VFG sand at base of interval. Some SILT
								52		
	53.0 - 58.0			70° 50-60°				53		Same as above: @ ≈ 55 FT, INCREASED SILT content and was iron staining for ≈ 6 in. Bottom of interval is same as above.
								54		
								55		
								56		
								57		
	58.0 - 63.0			80-90°				58		Same as above, fractures at 80-90°
								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.



LOG OF BORING NO. Z-86A

PAGE 7 OF 7

GEOLOGIST(S): *AKY*
 DATE: 8/24/69

PROJECT NO: 467-11-22

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
<i>Box 5/5</i>								61	---	<i>See previous page</i>
							62	---		
<i>↑ 60</i>							63	---		
<i>END OF BOXES</i>								64		
								65		
								66		
								67		
								68		
								69		

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. 2-86

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

USCS symbol
 DATE: 7/25/87

PROJECT NO: G67-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN LOG	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		1.3 (1)	CL				Clay 50%	0-1		First 0.5 ft: Large calcine 13x8 cm, sub-rounded, and dark yellowish brown silty clay (10yr 412). Some roots, trace sand. Changes rather abruptly to very pale orange (10yr 312) caliche. Moderate to low plasticity. Trace gravel.
	1.5								1-2		No Sample
	7.4								2-7		
	7.4 to 8.2		1.1 (1)	CL				Clay 75%	7-8		Top of interval. Dark yellowish brown silty clay. Some roots to very pale orange (10yr 812) to white (na) some sand + gravel.
	8.9 to 10.6		2.4 (1)	CL				Clay 75%	8-9		Silty clay, white to yellowish gray (na) to (5yr 812) mod. to high plasticity. Very calcareous (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.

* This interval ^{marked} starts at 7.4 but looks ^{surprisingly} like soil from close to surface.

LOG OF BORING NO. 2-86

PAGE 2 OF 2

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

USGS symbol
 DATE: *7/25/89*

PROJECT NO: *667-11.22*

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN LOG	SAMPLE NUMBER	FEET OF CORE IN BOX	FEET OF CORE IN LOG	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 1	8.9 to 10.6		2.4	CL						|	Silty clay. Light olive gray (5y 6/1) to Dark yellowish orange (10y 5/6). Moderate to high plasticity. Trace amounts of iron staining.
	10.6 to		(2) 2.7	CL				Clay > 50%	11 12	|	
	13.0 to 13.0								13	|	
											Bottom of Box

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



ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 3-86

PAGE | OF 4

GEOLOGIST(S): *DAY*
 DATE: *8/24/57*

PROJECT NO: *137-1-22*

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 4	0.0	0.0								TOP CIN: CLAY, greyish brown (5 YR 3/2), mod plast, some sand & VFG-FG, trace of gravel
		-1.5	(1) 3.8			100% clay	CL	1		1.7 FT - 1.8 FT: same as above; moderate yellowish brown (10 YR 5/4), trace of calc. material
		1.5-3.0	(1) 0.5			100% clay	CL	2		1.8 FT - 2.7 FT: very light grey (N8), some calcite; calcareous, some iron staining as mottles
		3.0-3.8						3		2.7 - 3.8 FT: same as above, brownish grey (5 YR 4/1), some roots, ^{surfacey green at 2.7 ft} no iron staining non-calcareous
		3.0-8.0	(2) 1.7			100% clay	CL	4		Same as above (2.7 - 3.8 FT) CLAY above : dark yellowish brown (10 YR grad - y to moderate yellowish brown (10 YR grad - y to light brownish grey (5 YR 6/1), best. mod plast, calcareous, some VFG-FG sand, some roots in top 3 in of interval, some iron staining as mottles,
		8.0-10.5	(1) 1.5			45% sand 55% clay	CL	9		VFG SANDY CLAY, very light grey (N8), mod low plast., non staining as mottles,

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. 3-86

PAGE 2 OF 4

GEOLOGIST(S): *Day*
 DATE: *5/1/86*

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
↑ 10.5										See previous page
	10.5 - 13.0	(1) 1.5				30% SAND 70% SILT		11 12		VFG SANDY SILTSTONE, moderate brown (5 YR 4/4) is non-apparent bedding, well weathered, poorly friable, increased VFG-FS silt fraction at bottom of interval.
	13.0 - 15.5	(1) 1.7				30% SAND 70% SILT		13 14		TOP 1 FT ↓ Same as above / Bottom of interval, fine silt , highly and clay SANDSTONE, Very pale orange (10 YR 8/2), non-apparent bedding, highly weathered, med-light friable, FS-MS, sub-angular-subround well-used sorted, slightly flowy texture, some clay
	15.5 - 16.0	(1) 0.4				100% SAND		15		Same as above; consolidated texture
	16.0 - 18.0	Ø						16 17		NO SAMPLE - 16.0 - 18.0 removed by Ward Hunt, Aug 13, 1986. Sample sent to CH&E Assoc.
	18.0 - 21.2	ND		50°	10°	100% SAND		18 19		Same as above: SLAB shows fractures filled w/ iron staining, at 10° bedding and distorted bedding, possible slump structures, some soft sed deformation

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. 3-86

PAGE 3 OF 4

GEOLOGIST(S): *lay*
 DATE: *8/24/69*

PROJECT NO: *873-1127*

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
↑ 21.2								-21-	+	
↓ 21.2	21.2 -23.0	(2) 2.0						-22-	+	SANDSTONES, very pale orange (10 YR 8/2), possibly distorted bedding, highly weathered, mod. friability, VFG=FG, sub-angular - sub rounded, mod. well sorted, some clay
	23.0 23.0 27.2							-23-	X	
Box 3 of 4								-24-	X	NO SAMPLE * - SEE PAGE 4 OF 4 (Box 4/4 appears to contain the sample from 23.0 - 27.2, this is logged on page 4 of 4)
								-25-	X	
								-26-	X	
								-27-	X	
↑ 28.0	27.2 -28.0	1.0 (2)				30% silt 70% clay		-28-	+	SILTY CLAYSTONS, pale yellowish brown (10 YR 6/2), non-apparent bedding, well weathered, mod. friable, some iron staining as ^{partly} matrix
See page 4 of 4								-29-	+	end of samples

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. 3-86

GEOLOGIST(S): *CLY*
 DATE: *8/24/89*

PROJECT NO: _____

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
<i>See p. 3 of 3</i>								<i>See p. 3 of 3</i>		
<i>23.1</i>	<i>24.0</i>	<i>(1) 1.3</i>		<i>10, 90° 70, 80° etc</i>				<i>23</i>	---	CLAYSTONE, light brown to grey (S YR 6/1), non-apparent bedding (slightly tabular), well weathered, mod. friable, some iron staining along 70, 80, 90° fractures, some carb. material, abundant micro fractures
	<i>24.0 -26.5 25.2</i>	<i>1.4 (2) (2)</i>						<i>24</i>	---	<i>Same as above</i>
<i>25.2</i>	<i>26.5</i>	<i>(2) 1.3</i>						<i>25</i>	---	<i>Same as above; consolidated texture</i>
<i>26.5</i>	<i>27.2</i>	<i>(2) 1.0</i>						<i>26</i>	---	<i>Same as above</i>
<i>27.2</i>								<i>27</i>	---	
<i>END OF BOXES</i>								<i>23</i>		
								<i>27</i>		

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. 4-86

PAGE 1 OF 2

GEOLOGIST(S): *lay*
 DATE: 8/22/87

PROJECT NO: 7-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE OF 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 - 1.5					70% CLAY 30% SAND	CL			SANDY CLAY, dark yellowish brown (10 YR 4/2), med plant, some gravel, some calc.
		ND				70% SAND 30% CLAY		1		BOTTOM OF INTERVAL: 3/4 CLAYEY SAND, very pale orange (10 YR 8/2), sub-angular, subrounded, poorly graded, increasing clay fraction at bottom 3/2 in of interval, sand is FG-FG
	1.5 - 3.0					80% SAND 20% CLAY	CL	2		5 - 20 above: med yellowish brown (10 YR 5/4), sand is FG-CG, slightly calc. Bottom 0.5 FT: Clay, dark yellowish brown (10 YR 4/2), med-high plant, some possible root holes (2-4 mm diameter) w/ degraded, calc material in soil, some calc. removed
	3.0 - 4.0	Ø						3	X	Removed Aug 13, 1986 by WAZZ TEST
	4.0 - 6.5	Ø						4	X	SAMPLE SENT TO CHEN ASSOCIATES
								5	X	
								6	X	NO SAMPLE
	*4.3 - 5.0	(1) 1.8				100% clay	CL	7		Clay, dark yellowish-brown (10 YR 4/2), est. med plant, some sand MG-FG, v. slight calc.
	8.0 - 11.7	(1) 0.8				70% GRAVEL 30% CLAY	CC	8		
								9		CLAYEY GRAVEL, dark yellowish-brown (10 YR 4/2), sub-angular-subrounded, poorly graded, max size = 7mm

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. 4-86

PAGE 2 OF 2

GEOLOGIST(S): *AW*
 DATE: 8/22/89

PROJECT NO: 167-1127

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
Box 1 of 2								11	(11)	See previous page
↑	11.7 -13.0	(1) 1.7				55% SAND 30% CLAY 15% gravel SC		12	(12)		Gravelly clayey SAND, dark yellowish orange (10 YR 6/6), angular-subangular mod graded, Sand size = VFG-FG, max gravel size = 7 cm (at base of interval), non staining as matrix
↓	13.0 -14.0							13	(13)	(13)
Box 2 of 2								14	(14)	SANDY Clay, light gray (N7) - cl grayish orange (10 YR 7/4), mod-high plastic, Sand is VFG-FG, trace of iron staining as matrix - cl nodules.
↑	14.0 -18.0					60% CLAY 40% SAND CL		15	(15)		(15)
END OF BOXES								18	(18)	(18)
								19	(19)	(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. 4-86

PAGE / OF 5

GEOLOGIST(S): DCB

DATE: 2/17/89

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					>50% clay	CL			Clay, brownish gray (5 YR 4/1), moderate plasticity, trace of silt, some roots and plant debris in upper 1.0 ft.
	to	ND						1		
	1.45							2		
	to	ND						3		
	3.0								X	No Sample
	3.0	0								
	3.5					>50% clay	CL			As above (reference interval 0.0 to 2.0 ft.) trace of iron staining, roots and plant debris are absent, calcareous.
	to	(1) 2.7						4		
								5		
								6		
								7		
	8.0					>50% silt	ML			Silty clay, yellowish gray (5 Y 7/2), high plasticity, trace of iron staining, increase in silt content with depth. Possibly highly weathered rock.
	to	(1) .5						8		
	10.6							9		

Box 1 and 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.
 + Recovery is noted as 2.7 ft. in box.



ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 4-86

PAGE 3 OF 5

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

PROJECT NO: 627-1122

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 204	12.0 to 20.5	(1) 1.0				250 Clay	CL		---	As above, concentrations are constant.
	20.5 to 21.5	0						-21-	X	No Sample
Box 205	21.5 to 22.0	ND				250 Clay			---	Claystone, light gray (N7), bedding not apparent, highly weathered, moderately to highly friable trace of iron staining, slight to moderate silt fraction.
	22.0 to 23.0							-22-	---	
Box 206	23.0 to 25.5	(1) 1.9 *							---	
	25.5 to 28.0	(1) 1.9 *						-23-	---	
Box 207	28.0 to 30.5	ND KS DCB						-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.
 * Recovery footage noted in box.



ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 4-86

PAGE 4 OF 5

GEOLOGIST(S): DCD
 DATE: 2/17/87

PROJECT NO: 557-1100

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	28.0 29.5	ND								As above, still highly weathered but less so than section of interval above, slightly friable, color grades to medium gray (NS).
	20.5	ND					31			
	to						32			
	23.0 23.0						33			
	to						34		Claystone, medium gray (NS), bedding may be thin and horizontal based on appearance of core breaks, well weathered, slightly friable, abundant fine platy mica and fractures, localized dark mineralization probably carbonaceous, some silt.	
	35.5 35.5		1.9				35			
	to						37			
	to		1.8		90°		38			
	40.5				75°		39			

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



ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 4-86

PAGE 5 OF 5

GEOLOGIST(S): DCB

DATE: 8/17/88

PROJECT NO: 167-112

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 A	35.4	1.8 (1)				> 50% Clay			|	Claystone as above highly weathered, highly friable, iron staining reduced to a trace. Interval becomes less weathered and friable below 41 ft.
	40.5						41	|		
	42	2.5 *					42	|		
	43.3						43	|		
								44	|	Bottom of Box 4 of 4 at 42.3 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.
 * Recovery footage noted in box on interval markers



ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 5-86

PAGE 2 OF 2

GEOLOGIST(S): *GA*

DATE: *8/18/87*

PROJECT NO: *667-1132*

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						11	X	No Sample
	11.1							12	---	Clay. Pale yellowish brown (10yr 6/2) to d.k. yellowish brown (10yr 6/2). Some silt. Some iron oxide concretions.
	12.0	.5				Clay > 5%	CL	13	---	
		12				Clay > 5%	CL	14	---	Same as above.
14.0	14.0							15		Bottom of Box
								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. 6-86

PAGE 1 OF 2

GEOLOGIST(S): DCD

DATE: 3/23/89

PROJECT NO: 667-11-27

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE OF 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, pale yellowish brown (10 YR 6/2), moderate plasticity (est), same as 14 and 15.
↓	0.42							1	X	No Sample
	to	0						2	X	
	2.33					>50% clay	CL			Clay, pale yellowish brown (10 YR 6/2), low to moderate plasticity, some gravel, some plant debris in upper 1.3 ft.
	2.33	ND						3	-	
	3.23							4	-	
	3.23 to 4.0	ND						5	-	
	to	(1) .3						6	-	
	6.0							7	-	
	6.0	(1) .3						8	-	clay as above with decrease in gravel fraction with depth.
	7.6							9	-	
	7.6 to 8.0	.2(1)						10	-	
	8.0							11	X	No Sample
	to	0						12	X	
	10.0									

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. 6-86

PAGE 2 OF 2

GEOLOGIST(S): DCB
 DATE: 8/27/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 ↑ 14.0	10.0					50% Clay	CL		○	Clay, light brownish gray (5 NR G), moderate high plasticity, cobbles at ~10.0 ft. decrease in silt fraction with depth and color change below 11.25 ft to medium light gray (NG).
	to	(1)							- - - - -	
	11.25	.6							- - - - -	
	to	(1)							- - - - -	
	12.0	.2							- - - - -	
	12.0						- - - - -			
	12.35	NID						- - - - -		
	12.35								- - - - -	
	to								- - - - -	
	14.0								- - - - -	
								14	- - - - -	Bottom of Box 1 at 14.0 ft.
								15	- - - - -	

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. 7-86

PAGE 1 OF 1

GEOLOGIST(S): CAA

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 1 of 1	0.0									Silty Clay. Dk. yellowish brown (10YR 4/2). Fst. plast. mod. to high. Some grass & roots from surface. Some gravel (avg. size 2.5 cm.). Trace sand, vfg. to med. grained.	
	1.3 ⁽¹⁾					Clay >50%	CL	1			
	2.0							2		Same as above.	
		(1) 3.5					Clay >50%	CL		3	
	4.0							4			
		(1) 1.15					Clay >50%	CL		5	Silty Clay. Dk. yellowish orange (10YR 6/6) to yellowish gray (5Y 8/1). Plast. mod. to high.
	6.0							6			
		(1) 2.2					Clay >50%	CL		7	Same as above. More silt. Bottom of interval has black discoloration in matrix. Maybe organics* (oil).
	8.0							8			
8.2	.3					Clay >50%	CL	8	Same as above, some black carbonaceous material.		
	(1) 2.2					Clay >50%	CL	9	Same as above.		
10.0											

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.

* This box has a distinct odor, may be organics.

LOG OF BORING NO. 8-26

PAGE 1 OF 2

GEOLOGIST(S): *Day*
 DATE: *8/23/89*

PROJECT NO: *677-1122*

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) 1.8				20% SAND 80% CLAY	CL	1	---	TOP 1 FT: SANDY CLAY, moderate yellowish brown (10 YR 5/4), mod. plast., some gravel (max size = 3 mm), see notes in top of interval. Bottom of interval: CLAYSTONE, yellowish gray (5 Y 8/1), non-apparent bedding, well weathered, mod - poorly friable, fine iron staining as mottles, trace of calc. material at base of interval. Same as above: some calc. material Same as above: trace of calc. material Same as above Same as above Same as above: yellow texture, no calc material, some silt Same as above
	2.0-4.0	(2) 2.5				100% CLAY	Ca	2	---	
	4.0-5.0	(2) 1.4				100% CLAY		3	---	
	5.0-7.0	(1) 1.85				100% CLAY		4	---	
	7.0-9.0	(1) 1.85				100% CLAY		5	---	
	8.1-9.0	ND						6	---	
	9.0-11.0	(2) 2.3						7	---	
								8	---	
								9	---	

Box 1 of 3
 Box 2 of 3
 Box 3 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. 8-34

PAGE 2 OF 2

GEOLOGIST(S): *Day*

DATE: *8/10/59*

PROJECT NO: *42-1122*

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
						100% clay				See previous page
	11.0 - 11.8	(2) 7.0				100% clay		11		CLAYSTONE, light olive yellowish grey (SY 6/1), apparent massive bedding, well weathered, mod- friable, some iron staining as mottled, some silt, trace of Mg staining
	11.8 - 13.0	(2) 1.55				100% clay		12		Same as above: apparent horizontal bedding, trace of carb material, increased iron staining
	13.0 - 15.0	(2) 2.1				20% silt 80% clay		13		TOP 1 FT: See as above, increased silt fraction
						20% silt 80% clay		14		BOTTOM 1.5 FT: CARBONACEOUS CLAYSTONE, olive black (SY 2/1) to olive grey (SY 4/1); apparent horizontal laminar bedding, well weathered, mod friable, some silt, some iron staining as mottled, trace of horizontal coal seams (1 inch thick)
	15.0 - 17.0							15		See as above:
								16		
	17.0 - 19.0							17		Bottom 2 in. silt CLAYSTONE, yellowish-grey (SY 8/1), non-apparent bedding, well weathered, mod-high friability, trace of iron staining, trace of Mg staining
								18		Same as above. Highly fractured at base of interval, at base of interval is carbonaceous and olive black (SY 2/1)
								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. 8-86

PAGE 1 OF 6

GEOLOGIST(S): *llg*
 DATE: *8/23/69*

PROJECT NO: *667-11.23*

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE OF INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 1 of 5	20.0 ↓ -21.5	(2) 0.3				3 40% silt 60% clay		21		Silty claystone, light olive grey (S V G/1), apparent massive bedding, highly weathered, mod. poorly friable, trace of carb material, trace of iron staining as mottles
	21.5 -26.5	(2) 2.3		90° 75°		30% silt 70% clay		22		Same as above: some 90° ^{75°} fracturing showing slicken sides, no iron staining
								23		
								24		
								25		
								26		
								27		Same as above: no apparent fracturing, trace of iron staining as mottles
	26.5 -31.5	(2) 3.5						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.

GEOLOGIST(S): *DW*
 DATE: *8/23/69*

PROJECT NO: *607-1122*

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	
<i>Box 1 of 5</i>								31			
	<i>31.5</i>	<i>-32.5</i>	<i>(1)</i> <i>0.5</i>			<i>40% SILT</i> <i>60% CLAY</i>		32			<i>SILTY CLAYSTONE, light olive gray (5 Y 6/1) non-apparent bedding, highly weathered mod. poorly friable, some carb material, trace of iron staining common.</i>
<i>Box 2 of 5</i>	<i>32.3</i>	<i>-36.5</i>	<i>(1)</i> <i>4.0</i>			<i>40% SILT</i> <i>60% CLAY</i>		33		<i>TOP 2 FT OF INTERVAL: CARBONACEOUS SILTY CLAYSTONE, olive gray (5 Y 4/1) at top of interval, olive black (5 Y 2/1) at middle of interval, non-apparent bedding, highly weathered, mod friable.</i>	
					<i>85°</i>			34			<i>BOTTOM 2 FT: SILTY CLAYSTONE, light olive gray (5 Y 6/1), non-apparent bedding, highly weathered, mod friable, fractured at 85° showing slickensides, some carb material.</i>
	<i>36.5</i>	<i>-41.5</i>	<i>(1)</i> <i>4.1</i>			<i>40% SILT</i> <i>60% CLAY</i>		37				Same as above: Bottom of interval is olive gray (5 Y 4/1)
								38			
								39			

DISCREPANCY BETWEEN 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.



LOG OF BORING NO. 8-86

PAGE 4 OF 6

GEOLOGIST(S): *fy*
DATE: 8/23/69

PROJECT NO: *45-1-12*

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION	
See previous page											
Box 3 of 5	51.5 -53.4					45% SILT 55% CLAY		52	-	Silty claystone, olive grey (5 Y 4/1), non-apparent bedding, highly weathered, mod-poorly friable, trace of carb, trace of iron staining. decreased silt fraction at base of interval	
						30% SILT 70% CLAY		53			
	53.7 -54.8					45% SILT 55% CLAY		54			Same as above; light olive grey (5 Y 6/1)
	54.8 -55.6	ND				55% CLAY 45% SILT		55			Same as above
Box 4 of 5	55.6 -56.5	(2) 0.6				80% SILT 40% CLAY		56	-	SANDY SILTSTONE, OLIVE GREY (5 Y 4/1), non-apparent bedding, mod-poorly friable, highly weathered. @ top of interval and light olive grey (5 Y 6/1) at bottom of interval, non-apparent bedding, highly weathered, mod friable, some carb material, trace of iron staining	
	56.5 -59.5	(1) 2.0						57			
								58			
	59.5 -61.5	(2) 1.8				70% SILT 30% SAND		59			VFG SANDY SILTSTONE, light olive grey (5 Y 6/1), silt shows massive

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. 8-86

PAGE 5 OF 6

GEOLOGIST(S): *AY*
 DATE: *2/23/89*

PROJECT NO: *65-11*

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE OF INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
								61	[Symbol]	Bedding w/ possible burrowing & highly weathered, poorly friable, trace of carb material, trace of iron staining, fine clay
Box 4 of 5	61.5 - 63	ND				20% SAND 80% SILT		62	[Symbol]	VFG SANDY SILTSTONE, light olive gray (5 Y 6/1), to massive bedding, highly weathered, poorly friable, trace of carb material, trace of iron staining, mottled, fine SAND
	63.3 - 65.3	(7) 1.7						63	[Symbol]	SILTSTONE, light olive gray (5 Y 6/1), non non-apparent bedding, highly weathered, poorly friable, fine clay at bottom of interval
	65.3 - 66.5	(17) 6.7						64	[Symbol]	SILTY CLAYSTONE, olive gray (5 Y 4/1), non-apparent bedding, highly weathered, mod friable, some carb., trace of coal ± 1-2 mm.
↑ 65.3 ↓	66.5 - 71.5	(1) 3.1						65	[Symbol]	See as above: to light olive gray (5 Y 6/1)
Box 5 of 5								66	[Symbol]	
								67	[Symbol]	
								68	[Symbol]	
								69	[Symbol]	

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. 8-86

PAGE 6 OF 6

GEOLOGIST(S): *MS*
 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
<i>Bot's 5' of</i>								71	/ / / / /	<i>See previous page</i>
<i>↑ 71.5</i>								72		
<i>END OF Boxes</i>								73		
								74		
								75		
								76		
								77		
								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. 8-80A

PAGE | OF |

GEOLOGIST(S): *Day*
 DATE: *5/20/69*

PROJECT NO: *42-1122*

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	---	SANDY CLAY, moderate yellowish brown (10 yr 5/4), mod-poor plant. s-cl w FG-MG, some roots and some gravel (max size = 7cm)
↑ 2.0		1.A					2	---		
								3		
								4		
								5		
								6		
								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. 9-86

PAGE 2a OF 4a

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

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
9.33 to 11.0						Gravel >50%	GC	11	0-0	See previous page for description.
12.5		(1) 3				Gravel >50% Clay 22.5% Silt 22.5%	GC	12	0-0	Sandy, Clayey gravel. Pred. med. gray (N5) sub angular to sub rounded. (Grain size 3.5 cm. Matrix Grayish orange. (10yr 7/4). Est. plasticity low.
14.0		0				Gravel >50% Clay 22.5% Silt 22.5%		13	X	No Sample.
15.0		0						14	X	
15.5		.45 ⁽¹⁾						15	0-0	Same as above. Angular to sub rounded. well graded.
17.5		0						16	X	No Sample.
18.5		.3 ⁽¹⁾				Clay >50%		17	X	
19.2		.5 ⁽¹⁾				Clay >50%		18	X	Sandy silty clay. Dk. yellowish orange (10yr 6/16). Est. plast. low sand coarse to granular. Med. graded. Some gravel rounded to 1.5 cm.
20.0		0						19	X	Same as above
								20	X	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. 9-86

PAGE 3a OF 4a

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

PROJECT NO: 357-122

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
	20.0							21	X	No Sample
		0					22			
							23			
	24.0						24			
Box 1 of 1		30)				Clay > 50%	CL	25	/	* No Sample UAA Silty Clay, dk. yellowish orange (10 yr 6/6). Est. plast. low to mod. some sand v.f.g. to coarse.
		Q ₄						26		
								27		
		27.5						28	X	No Sample
		0					29.0			
		0					29.9			

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.

* Had to erase lith log here to correct. UAA 8/15/89.

LOG OF BORING NO. 9-86

PAGE 4a OF 4a

GEOLOGIST(S): LPA
 DATE: 5/2/89

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 30.5	0 30.5	0 .8				fine to med. sand clay	GC CL		0.00	sandy clayey gravel. No predom. color as noted. Sub round to 7.5mm: mod. well sorted. Sand: f. to coarse. Grdles to clay yellowish gray. Est. plant. mod. to high. some silt. trace silt. trace loam material.
								31		Bottom of Box
								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. 9-86

PAGE 1 OF 12

GEOLOGIST(S): UFA

DATE: 5/11/84

PROJECT NO: 457-102

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		
								32		
								33		
								34		
								35		
								36		
								37		Beginning of Boxes
37.0	37.0							37	X	No Sample
Box 1 of 8	to	0						33	X	
								39	X	
	42.0									

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. 9-86

PAGE 2 OF 12

GEOLOGIST(S): CAF

DATE: 8/14/89

PROJECT NO: 47-102

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE 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 8	37.0							41	X	No Sample
	to	0						42	X	
	42.0							43	---	Claystone Between yellowish gray + light olive gray (5y 8/1 - 6/1) mod. to highly weathered. Mod. friable. Bedding not evident. Iron staining common in matrix. Black carbonaceous material and leaf prints visible.
		1.7				Clay > 50%		44	---	
	45.0							45	---	
		1.0				Clay > 50%		46	---	
	47.0							47	---	Same as above. Significant iron staining in vertical fractures. Possible slickensides visible.
	47.0							48	---	
	to	0						49	X	
	51.0								X	

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. 9-86

PAGE 3 OF 12

GEOLOGIST(S): *WJ*

DATE: *8/14/89*

PROJECT NO: *67-122*

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
								51	X	No Sample
	51.0							51	---	Claystone Lt. Olive gray (Sy 6/1), Mod. weathered. Mod. to slightly friable. Bedding not evident. Iron staining in fractures.
								52	---	
		.6						53	---	
								54	---	
								55	---	
	56.5							56	---	
								57	/ / / / /	Silty Claystone Lt. olive gray to olive gray (Sy 5/1) Mod. weathered. Slightly friable. Massive bedding. Iron staining in vertical fractures. Some CaCO ₃ mineralization in fractures.
	58.5	1.8 (2)					Clay 75%	58	/ / / / /	
	60.5							59	/ / / / /	Same as above. Iron staining not as heavy. Not as many fractures.
		1.1 (2)					Clay 75%	59	/ / / / /	

Box 1 of 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. 9-86

PAGE 4 OF 12

GEOLOGIST(S): LAA

DATE: 8/14/87

PROJECT NO: 47-1122

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
	60.5					Clay >50%			/ / / / /	See previous page for description.
	61.0	.5				Clay >50%		61	/ / / / /	Silty Claystone. Olive gray (5y 4/1). Possible horizontal bedding. Mod. weathered. Slightly friable. Some carb. material.
62.0	62.0	1.75				Clay >50%		62	/ / / / /	Same as above.
Box 2 of 8	65.5					Clay >50%		63	/ / / / /	Same as above.
			(2)					64	/ / / / /	
								65	/ / / / /	
								66	/ / / / /	
								67	/ / / / /	
	67.0	1.25				Clay >50%		68	/ / / / /	Same as above. Some possible slicken-sides present in fracture
	69.0		(1)			Clay >50%		69	/ / / / /	Same as above. No slicken sides. Less silty.
	69.6	.4(2)				Clay >50%		70	/ / / / /	
										See Next page for description.

Boring No. 9-86 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. 9-86

PAGE 5 OF 12

GEOLOGIST(S): W.P.

DATE: 8/14/59

PROJECT NO: P-17122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE OF INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
69.6	to	1.6 (2)				Claystone		71	---	Claystone. Olive gray (5y 4/1). Mod. weathered. Slightly friable. Bedding not evident. Some silt. Some carb. material.
71.6		.65 (1)				Silty Claystone		72	---	Silty Claystone. Olive gray (5y 4/1). Mod. weathering. Slightly friable. Bedding not evident. Some carb. material.
72.0		0						73	X	No Sample
74.0						Claystone		74	|	Same as above.
		1.8 (1)				Claystone		75	|	
		1.5 (1)				Claystone		76	|	
77.5						Claystone		77	|	
		1.5 (1)				Claystone		78	|	Same as above. Some possible vertical slickensides.
79.0		1.0 (2)				Claystone		79	|	Claystone. Lt. olive gray to olive gray (5y 6/1 to 5y 4/1). Massive bedding. Mod. weathered. Slightly friable. Possible slickensides.
80.0										

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.

Begin Box



ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 9-86

PAGE 6 OF 12

GEOLOGIST(S): UAF

DATE: 5/14/89

PROJECT NO: 157-33

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
80.0	80.0 ⁽¹⁾ 80.6	5 ⁽¹⁾				Clay 78%			----- ----- -----	Claystone, brownish gray (Sur 4/1). Massive bedding, mod. weathered. Slightly to mod. friable.
		0						81 82	X X	No Sample
	82.3					Clay 78%		83	----- ----- -----	Same as above. Slightly silty.
	83.5	1.1		60° From Horiz		Clay 78%		84	----- ----- -----	Claystone, as above. Trace carb. material.
	84.0	.6 ⁽¹⁾				Clay 78%		85	----- ----- -----	Same as above
	85.0	1.1				"		86	----- ----- -----	Same as above, slightly silty.
	87.0	1.7				"		87	----- ----- -----	
						"		88	----- ----- -----	Silty Claystone. Same as above. Some carb. material. Possible horizontal bedding.
	89.0	1.5 ⁽²⁾				"		89	----- ----- -----	See Next page for description.

box 3 of 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. 9-86

PAGE 7 OF 12

GEOLOGIST(S): *WJ*

DATE: *7/11/87*

PROJECT NO: *637-1122*

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
↑ 91.0	91.0	1.8 <i>5</i>				Clay 76%		91	//	Silty Claystone. Brownish gray (5yr 4/1) mod. weathered. Slightly friable. Bedding possibly horizontal. Some carb. material (leaf prints).
↓ 91.0	91.0	(2) 1.7	<i>52</i>			Clay 76%		92	//	Silty Claystone. Brownish gray (5yr 4/1). Mod. weathered. Slightly friable. Bedding thin wavy somewhat horizontal. Soft sed. deformation. Some carbonaceous material present in layers.
	93.0					Clay 75%		93	---	Silty Claystone. Lt. Brownish gray (5yr 4/1) mod. weathered. Slightly friable. Abundant carb. material in layers. Some silt. Matrix very slightly calcareous.
	94.0	.7				"		94	---	Claystone, same as above. Some iron staining. Not as carbonaceous toward bottom.
	95.0	1.0				"		95	---	Claystone. Brownish gray (5yr 4/1). Mod. weathered. Slightly friable. <u>Abundant</u> carb. Bedding not evident. Trace carb. material. Some iron staining. leaf print visible.
	98.0	.9				"		98	---	Claystone. Same as above. <u>More</u> carb. material.
	99.0	.85				Clay 77%		99	//	Silty Claystone. Lt. brownish gray (5yr 6/1). Mod. weathered. Slightly friable. Bedding not evident. Trace carb. material + iron staining.
	100.0									

Box 4 of 8

Bedding 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. 9-86

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GEOLOGIST(S): UAA

DATE: 8/15/89

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 5 of 8	112.0					Clay 75%		111	|	Silty Claystone. Lt. Brownish gray to brownish gray (5y 6/1 to 4/1). Highly weathered. Tends to highly friable. Some v. fine sand in matrix. Trace carb. material.
	113.0	.95(1)	5A			Clay 75%		112	|	Silty Claystone. Lt. olive gray (5y 6/1). Slightly to med. weathered. Slightly friable. Bedding not evident. Looks like soft soil. deformation. Some carb. material.
	114.0					Clay 75%		113	|	
	114.8	.8(2)	5A			Clay 75%		114	|	
	116.7	1.9(3)		50° from horiz.		Clay 75%		115	|	Silty Claystone - as above. Some 50° Fractures showing slickensides
Box 6 of 8	116.7					Clay 75%		116	|	
	117.6	1.7		60° from horiz.		Clay 75%		117	|	Same as above. Slightly weathered. Fractures also show slickensides.
	118.6					Clay 75%		118	|	
	119.0	.35(2)				Clay 75%		119	|	Same as above
120.5	1.4(4)				Clay 75%		120	|	Silty Claystone. Lt. olive gray (5y 6/1). Slightly to med. weathered. Slightly friable. Bedding not evident.	

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.

116.7 Begin New Box



ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 9-86

PAGE 10 OF 12

GEOLOGIST(S): UFA

DATE: 3/15/89

PROJECT NO: 17-22

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
	120.5									See previous page for description
		1.8(2)			Clay 75%			121		Silty claystone. Lt. olive gray. Slightly to mod. weathered. Slightly friable. From weathering, bed lines appears horizontal. Can be faint cross bedding in areas. Some v.f.g. sand.
	123.0	1.0(2)			Clay 75%			123		Silty claystone as above grades to sandstone, yellowish gray (5y 8/1). Mod. weathered. Slightly friable. Bedding appears horizontal. v.f.g. sand. poorly graded (well sorted). Trace silt + clay
	124.0	1.7(2)	UFA #5		30°	Sand 50%		124		Same as above sandstone. Bedding slightly tilted
	124.8	1.8(2)			35°	Sand 50% 5.1% 5.0%		125		Same as above sandstone Bedding slightly tilted. UFA
	126.9							126		Interbedded silty claystones + very fine grained sandstones as above. Bedding appears horizontal. Color, weathering + friability as above.
	126.9							127		Sandy siltstone UFA Silty claystone. Lt. olive gray (5y 6/1) mod. weathered. Slightly friable. Bedding thin laminar, predominantly horizontal. Sand v.f.g. well sorted. Trace carb. material
	129.0	1.8(2)						128		
	to 130.7	1.7(2)			0° to 30°	5.1% 75%		129		Sandy siltstone. Lt. olive gray (5y 6/1). Slightly weathered. Slightly friable. Bedding thin laminar parallel then tilted after an unconformity. Sand v.f.g. well sorted.

Box 6 of 8
↑

Box 7 of 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. 9-86

PAGE 11 OF 12

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

PROJECT NO: 87-122

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
	130.1									See previous page for description.
	131.0	1.3 ⁽²⁾					Silt 50%	131	X	Sandy siltstone. Lt. olive gray (5y 6/1). Slightly weathered. Slightly friable. Thin laminar. Near horizontal bedding. Sand v.f.g. well sorted. Trace iron staining.
								132	X	No Sample
								133	X	
	133.8									
	134.0	.15					Silt 50%	134	X	Same as above.
		1.1 ⁽¹⁾					Silt >50%	135	X	Siltstone as above grading to claystone. Lt. olive gray. Slightly weathered. Slightly friable. Bedding not evident.
	136.1						Clay 75%	136	X	
		1.45 ⁽²⁾					Clay >50%	137	X	Silty claystone. Lt. olive gray (5y 6/1). Interbedded w/clayey siltstone. Slightly weathered. Slightly friable. Thin laminar bedding. Predom horizontal. Trace carb. material.
	137.9						Clay >50%	138	X	Same as above. Becomes more carbonaceous toward bottom.
	139.0						Clay >50%	139	X	
	140.0						Clay >50%	140	X	Silty claystone. Lt. olive gray (5y 6/1). Slightly weathered. Slightly friable. Bedding not evident. Some carb. material. Some iron staining.

Box 7 of 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.



ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 9-86		PAGE 12 OF 12	
GEOLOGIST(S): UFA		DATE: 8/15/87	
PROJECT NO: 5-7			
TOP/BOTTOM OF CORE IN BOX	140.0	142.5	144.0
TOP/BOTTOM OF INTERVAL	140.0	142.5	144.0
FEET OF CORE IN INTERVAL IN BOX	1.7 (2)	0.3 (2)	1.6 (2)
SAMPLE NUMBER			
FRACTURE ANGLE			
BEDDING ANGLE			
GRAIN SIZE DISTRIBUTION	75%	75%	77%
USCS SYMBOL			
DEPTH IN FEET	141	142	143
LITHOLOGIC LOG	Diacystone, lt. olive gray to olive gray. Slightly to mod. weathered. Stagnant fracture. Bedding not evident. Trace iron staining. Trace carb. material.	Same as above. Slightly less stony. Slightly to mod. friable.	Same as above. Slightly friable.
LITHOLOGIC DESCRIPTION	Diacystone, lt. olive gray to olive gray. Slightly to mod. weathered. Stagnant fracture. Bedding not evident. Trace iron staining. Trace carb. material.	Same as above. Slightly friable.	Diacystone olive gray (5y 4/1). Mod. weathered. Slightly friable. Bedding not evident. Some silty. Some carb. material.
			Same as above.
			Bottom of Boxes

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

LOG OF BORING NO. 9-86

PAGE 1a OF 4a

GEOLOGIST(S): CAF

DATE: 3/15/39

PROJECT NO: 137-1102

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	.5(1)				Gravel 75% Silt 25%	GC		0 0 0 0 0 0	Silty Gravel. Predom. med. dk. gray (N6) Angular to sub angular. Well graded. Grains to 4.5 cm. Some dry silty clay matrix. Trace sand. v.f.g. to coarse. Trace surface roots & grass.
	1.5	0						1	X	No Sample
		0						2	X	No Sample
		0						3	X	No Sample
	4.5							4	X	No Sample
		0						5	X	No Sample
	5.5									
	6.0	.4(1)				Gravel 37% Sand 53%	GW	6	0 0 0 0 0 0	Sand and Gravel. Gravel pred. med. gray (N5). Angular. Mod. sorted. Grains to 3 cm. Sand grayish orange v.f.g. to granules. Mod. well graded. Some silt + clay.
		.3(1)				Gravel 75%	GW	7	0 0 0 0 0 0	Gravel. Pred. med. dk. gray (N4). Angular to sub rounded. Well graded. Grains to 3.5 cm. Some silty clay matrix. Some sand. v.f.g. to coarse.
	7.5									
		0						8	X	No Sample
	8.5									
		0						9	X	No Sample
	9.33 to 11.0	.6(1)				Gravel 75%	GC		0-0 0-0	Sandy clayey gravel. Color + angularity as above. Poorly graded. To 2.5 cm. Matrix very pale orange to grayish orange (10% silt to 7%). Sand v.f.g. to coarse. 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. 11-86

PAGE 2 OF 2

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

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
10.0	10.0					75% clay	CL			Clay as above
↓	+	(1)								Interval grades to siltstone, Sandstone very light gray (N8), bedding not apparent, well weathered, moderate to slightly friable, very fine grained sand, abundant silt, iron staining both locally and on fractures.
Box 2	11.5	2						11		
↓	+	ND						12		
Box 2	13.0							13		
↓	+	(2)						14		
Box 2	14.0	.8						14		
↓	+							15		
Box 2	15.0	ND						15		Bottom of Box ²⁰²² at 15.0 ft.
								16		

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. 12-86

PAGE 1 OF 2

GEOLOGIST(S): *WA*

DATE: *8/18/87*

PROJECT NO: *037-110*

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⁾				Clay >60%	CL	1	[Symbol: Diagonal lines]	Silty Clay, dk. yellowish brown (10yr 4/2) Est. plast. mod. abundant surficial grass root material. Some v.f. to f.g. sand.
	2.0					Clay >50% Gravel >30%	CL	2 3	[Symbol: Diagonal lines]	Silty Gravelly Clay, dk. yellowish brown (10yr 4/2) Est. plast. mod. Gravel angular to sub rounded. Mod. well graded. (0.5cm to 5cm). Some silty iron staining. More gravel toward bottom. Trace root material.
	4.0							4	[Symbol: X]	No Sample
	5.7	0						5	[Symbol: X]	No Sample
	6.0	.4 ⁽¹⁾				Gravel >50%	GW	6	[Symbol: Horizontal lines]	Clayey gravel. Cannot determine gravel color. Mod well graded granular to 6.5cm. Sub angular to sub rounded. Matrix dk. yellowish brown (10yr 5/4) Some silt.
	7.4	0						7	[Symbol: X]	No Sample
	8.0	.7 ⁽¹⁾				Gravel >50%	GC	8	[Symbol: Horizontal lines]	Clayey Gravel. No predom. gravel color. Angular to sub angular. Poorly graded. Max. size 5.5cm. Matrix dk. yellowish brown (10yr 4/2) Some silt + v.f.g. sand.
	10.0	1.5 ⁽¹⁾				Gravel 74% Clay 26%	GC	9	[Symbol: Horizontal lines]	Clayey gravel. No predom. gravel color. Sub angular to rounded mod well graded. Gravel to 6cm. Matrix grayish orange (10yr 7/4) Est. plasticity mod. to high. Some silt + sand. v.f.g. to v.c.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.

Boring
New
Box ↓



ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 12-86

PAGE 2 OF 2

GEOLOGIST(S): LAA

DATE: 8/18/57

PROJECT NO: 1171122

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	10.0	11.4	(1)			Clay > 40% 240%	GC	10.0 - 11.0	0-0	Clayey sand. No pebbles. gray color. Subangular to rounded. Med well sorted. Shrinkage 10-15%. Matrix orangish orange (20-25%) Est. Platt. mod. Some silt + sand, u.f.g. to v.c.g.
	11.0	12.4	(1)			Clay > 60%	CL	11.0 - 12.0	///	Silty Clay lt. olive gray (5yr 6/1) to dk. yellowish brown (10yr 6/1). Est. plat. mod. Possible highly weathered claystone. Some iron staining.
	12.0	13.5	(1)			Clay > 60%	CL	12.0 - 13.0	///	Same as above.
	13.0	14.9	(1)			Clay > 60%	CL	13.0 - 14.0	///	Clay (may be highly weathered claystone) lt. brownish gray (5yr 6/1) to lt. brown (5yr 5/1). Est. plat. mod. to high. Some iron staining + iron concretions. Some carb material.
	14.0	16.0						14.0 - 16.0	---	
16.0	16.0						16.0			Bottom of Boxes
								17.0		
								18.0		
								19.0		

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. 13-86

PAGE 1 OF 2

GEOLOGIST(S): DCD

DATE: 2/28/89

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					75% clay	CL	1		Clay, light brownish gray (5 YR 6/1), moderately high plasticity, some sand and gravel.
	to	1.6						2		
								3		
								4		
	5.0							5		
	5.0							6		Two larger gravel occur at ~ 7.8 ft
	to	(1) .45						7		
	8.0							8		
	8.0	(1) .3	0					9		
	9.0									Clay, light gray (N7), high plasticity, some silt, possibly highly weathered bedrock.
	to	N/D						10.5		

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. 13-86

PAGE 2 OF 2

GEOLOGIST(S): *D. R.*
 DATE: *2/22/57*

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
	9.0									<p style="text-align: center;">Clay as above</p>
	10.0	ND						11		
	10.5							12		
	12.0	(1)						13		
	13.0	1.7						14		
	15.5							15		<p>Clay, moderate yellowish brown (10 YR 5/4), moderate plasticity, some silt, some iron staining locally - silt fraction increases at ~ 13.0 ft.</p>
		ND						16		

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.



ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 378 14-86		GEOLOGIST(S): UH		DATE: 5/25/82		PROJECT NO: 6574-22				
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	4.3	34 (1)				CL	1	Diagonal hatching	Silty clay. Med yellowish brown (dry) to light yellowish gray mottled (w/uv). Some v.f.g. sand and gravel near surface. Avg. size 0.5 cm. Trace carbon in sample. Est. plasticity mod. to high.
4.7	4.7	4.3 (2)	34 (1)				CL	5	Diagonal hatching	Some clay above. Sand v.f.g. to med. size. Has some red material. Some iron staining (rusty).
8.0	8.0	3.4 (1)	34 (1)				CL	9	Diagonal hatching	Some clay above. Trace gravel to 5.5 cm.
8.0	8.0	0.5								

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

LOG OF BORING NO. 14-86

PAGE 2 OF 8

GEOLOGIST(S): *LA*

DATE: *5/25/79*

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
	10.5								/ / / / /	See previous page for description.
	11.0	1.5 ⁽¹⁾				Clay 75%		11	/ / / / /	Silty Clay. Grayish orange (10yr 7/4) to very Lt. gray (N 5). Est. plast. low to mod.
		2.2 ⁽¹⁾				Clay 75%		12	/ / / / /	Same as above
	13.0							13	/ / / / /	
		3.3				Clay 75%		14	/ / / / /	
								15	/ / / / /	Same as above.
								16	/ / / / /	
	17.0							17	/ / / / /	
	18.0	1.3 ⁽¹⁾				Clay 75%		18	/ / / / /	Silty Clay. Pale yellowish brown (10yr 6/2). Est. plast. low to mod. plasticity. Trace iron staining, trace carb material.
		1.9 ⁽¹⁾				Clay 75%		19	/ / / / /	Same as above.
	23.06								/ / / / /	

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



ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 14-86

PAGE 3 OF 8

GEOLOGIST(S): UAA

DATE: 8/25/89

PROJECT NO: 657-122

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
	18.0 ↑							21		<p>See previous page for description of this interval.</p> <p>No sample ↓</p> <p>Silty Clay Dk. yellowish brown (10yr 4.5) to brownish gray (5yr 4.5). Est. plast low to moderate ↓</p> <p>Silty Claystone lt. brownish gray to brownish gray. Highly weathered. med. to highly friable. Bedding appears massive. Some grayish orange (10yr 7.5) siltier areas. ↓</p>
	23.0						22			
Box 3 of 4	23.3	0					23			
							24			
	25.5						25			
							26			
							27			
							28			
							29			
							30				Same as above, trace iron staining.
							30.5			

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.

30.5 Bottom of Boxes **

Begin New Box



ROCKY FLATS PLANT

FIGURE NO.

* Not able to take measurement, core was in a black plastic trash bag.

... discovered marked 5 of 9 to 9 of 9

LOG OF BORING NO. 14-86

PAGE 4 OF 8

GEOLOGIST(S): UAA

DATE: 8/25/59

PROJECT NO: 5009

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
31.55	31.55	(3)				Clay > 60%		31		
										Beginning of Boxes ***
										Silty claystone (5y 4/1): Slightly weathered. Slightly friable. Bedding appears massive.
										Same as above.
										Same as above, silt fraction decreases in middle of interval but increases again at bottom.
										Same as above.
										Same as above. Some foraminiferous material. Probably wood fragments.
										No Sample
										Claystone. Lt. olive gray (5y 4/1). Slightly weathered. Slightly friable. Bedding appears massive. Trace iron staining around and pieces (seen) in size of small pieces of iron. See next page for details.

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 10 of 40

39.45 8 V
 37.15 (2) Clay
 35.0 Clay
 33.15 Clay > 60%
 32.50 Clay > 60%
 31.55 Clay > 60%

ROCKY FLATS PLANT

FIGURE NO.

** Continuation of N-86 4 of 4, This series is labeled 14-86 5 of 9 - 9 of 9



LOG OF BORING NO. 14-86

PAGE 6 OF 8

GEOLOGIST(S): CAA

DATE: 8/28/89

PROJECT NO: 657-122

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
50.25	50.25 ↑									Sand
	61.50	1.25 ⁽¹⁾					Sand ← >50% silt >10%	51		Siltstone. Pinkish gray (5YR 8/1). Mod. weathered, slightly to mod. friable. Thin layered bedding. Some cross bedding visible. (Horz. int. to ~25°) Some carb. material toward bottom of interval. Some v.f.g. sand. Trace iron staining. Sand v.f.g.
		2.4 ⁽²⁾	CAA #16				Sand ← >50%	52		Same as above interbedded with very thin layers of silty claystone. One 4 in. section of med. grained sandstone.
	53.3						Clay 73%	53		Claystone becoming more common toward bottom.
	54.3	.5 ⁽²⁾					"	54		Same as above.
	55.0	0						55	X	No sample
	55.9	.8 ⁽¹⁾					Clay ← >50%	56		Claystone. Brownish gray to Olive gray (5YR 4/1 to 5Y 4/1). Mod. weathered. Friable. Bedding not evident. Trace v.f.g. sand in very small beds. Trace iron staining.
	57.8	2.1 ⁽¹⁾		90°			Clay ← 76%	57		Same as above, some silt.
	59.5	0						58	X	No sample
	59.5	0						59	X	No sample
	60.85 ↓	1.3 ⁽¹⁾					Clay ← 76%			Same as above.

Blue
New
Box

box 7 of

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ROCKY FLATS PLANT

FIGURE NO.



ROCKY FLATS PLANT

FIGURE 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
71.4	71.4	1.85				Silt		71		See previous page for description.
71.4	71.4	1.8				clay		72		Silty claystone (4.5' olive gray to olive gray, slightly brownish, med. to slightly friable. Bedding not evident. Some conchoidal fracture. Silt lenses 1/4" x 2/8" near top. Grayish orange to med. brown (log 7 1/4 to 5 3/4').)
73.3	73.3	1.7	95			clay		73		Same as above. No silt lens.
74.5	74.5	0						74		No sample
								75		Bottom of Box

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

DATE: 8/25/86
 GEOLOGIST(S): UH

PROJECT NO: 457-102

LOG OF BORING NO. 15-86

PAGE 1 OF 2

GEOLOGIST(S): UAF

DATE: 3/14/89

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 1 of 2	0.0					Clay 75% Silt 20% Sand 2% Gravel 3%	CL	1	[Diagonal Hatching]	Silty Clay. Dusky yellowish brown. (log 4/2). Est. plast. moderate. Root material exists in top 1.8 ft. Some sand & gravel exist throughout interval. Sand v.f.g. to coarse. Gravel from approx. 1cm to 5.5cm. Sub angular to rounded. Matrix slightly calcareous in localized areas.
							2			
							3			
							4			
		5.0				Clay 75% Gravel 3%	CL	5	[Diagonal Hatching]	Gravelly Silty Clay. Dk. yellowish brown (log 4/2). Est. plast. moderate. Gravel Angular to subrounded. Mod. well graded. 1cm to .6cm. Some sand, f.g. to coarse. Some staining in matrix.
		6.0	1.4(1)					6	[Diagonal Hatching]	
						Clay 73% Gravel 20% Silt 7%	CL	7	[Diagonal Hatching]	Silty clay brownish gray (log 4/2) grades to dk. yellowish brown (log 4/2). Est. plast. mod. to high. Becomes argillaceous toward bottom. Angular to sub-angular. Grading not visible in matrix. Sand f.g. to granular. Trace carb. material.
		8.0	.9(1)					8	[Diagonal Hatching]	
						Clay 75% Gravel 23% Silt 2%	CL	9	[Diagonal Hatching]	Gravelly Silty Clay. Dk. yellowish brown. (log 4/2). Est. plast. moderate. Gravel angular to sub. rounded. Mod. well graded. Max size 5cm. Some sand. v.f.g. to v.c.g.
	10.5	1.85						[Diagonal Hatching]		

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ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 15-86

PAGE 2 OF 2

GEOLOGIST(S): UFA

DATE: 8/14/87

PROJECT NO: 15-86-22

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								/ / / / /	See previous page for description.
	11.5	1.0 (1)				Clay 75% Gravel 2.5%	CL	11	/ / / / /	Gravelly silty clay. Dk. yellowish brown (10YR 4/2). Est. plast. moderate. Gravel angular to sub rounded. Mod. well graded. Max. size 5mm. Some sand v.f.g. to v.c.g.
Box 2 of 2	12.5	1.0 (1)	UFA #3			Gravel 2.5%	GC	12	0.75 0.75 0.75	Clayey sandy gravel. Cannot determine gravel color. Subangular to sub-rounded. Mod. well sorted to 4.75 cm. matrix dk. yellowish brown (10YR 4/2) to lt. gray (N7). Est. plast. low to med. Sand v.f.g. to coarse. zone 5/11
	13.0	0.5 (1)				Clay 75%	CL	13	/ / / / /	Silty clay lt. brownish gray (5YR 4/1). Est. plast. mod. to high.
	13.3	0.3 (1)				Clay 75% Silt 25%	CL	13	/ / / / /	Same as above.
	14.3	1.0 (1)				Clay 75%	CL	14	/ / / / /	Silty clay grayish brown (5YR 3/2). Est. plast. moderate. Trace carb. material. Trace v.f.g. sand.
	15.5	1.2 (1)				Silt 70%		15	/ / / / /	
	16.5	1.0 (1)				Clay 75% Silt 20%	CL	16	/ / / / /	Silty clay. Pale yellowish brown (10YR 6/2). Est. plast. mod. Some iron staining throughout matrix. Some black carb. material.
	17.5	1.0 (1)				Silt 70%		17	/ / / / /	
	18.0							18	/ / / / /	Bottom of Boxes
								19	/ / / / /	

Begin New Box

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ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 16-86

PAGE 1 OF

GEOLOGIST(S): *LS*
 DATE: 8/1/89

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 ↓	0.0-5.0					50% SAND 30% CLAY 20% GRAVEL	SC	0		CLAYEY SAND TOP 2 IN: GRAVELLY, fine platy, pale yellowish brown (10 YR 6/2), angular - subangular, mod. well sorted, max gravel size = 3 cm, some roots & quartz at surface, slightly calc.
		(1)				10% GRAVEL 30% SAND 60% CLAY	CL	1		Gravelly sandy clay (possibly highly weathered claystone - well cemented) brownish grey (5 YR 4/1), mod. platy, max gravel size = 5 cm, trace of iron staining as concretions (2, 4 1 cm diameter) and mottled, trace of calcite in upper part of interval, increased sand fraction in bottom 2 in of interval
		4.4						2		
								3		
								4		
						45% SAND 50% CLAY 5% GRAVEL		5		GRAVELLY SANDY CLAYEY SAND, grayish orange (10 YR 7/4), subangular - subrounded, mod-well sorted, FG-CG sand, max gravel size = 6 cm, some silt
Box	5.0-6.5	(1)				58% SAND 30% CLAY 20% GRAVEL	SC	6		
		1.0						7		SANDY CLAY, light olive grey (5 Y 6/1), est. mod platy, iron staining as mottled & mottled, trace of gravel, sand is FG-MG
	6.5-7.0	ND				70% CLAY 30% SAND	CL	8		See as above, olive grey (5 Y 4/1)
	7.0-8.0	(1)				80% CLAY 20% SAND	CL	9		See as above; light olive grey (5 Y 6/1)
		1.3								
	8.0-10.0	ND				80% CLAY 20% SAND	CL	10		
↑										
10.0										

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.

ROCKY FLATS PLANT



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.

NOTES:

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 - 10.5	10.5					CV	10.5		Day, light olive gray (S Y 6/1), med. - blk. clay, trace of brown stain, some mica. Some of above: trace of basalt.
	10.5 - 13.0						CV	11		
	13.0 - 16.5						CV	12		
	16.5 - 17.5						CV	13		Top 1 FT; Same as above
	17.5 - 18.5						CV	14		Bottom of interval: Same as above, yellowish gray (S Y 8/1), more concentrated texture
	18.5 - 23.0						CV	15		Top 1 FT; Same as above
	18.5 - 19.5						CV	16		Bottom of interval: Same as above, light gray (N7), clayey texture.
	19.5 - 23.0						CV	17		See as above;
	23.0 - 3.0						CV	18		
	3.0 - 10.0						CV	19		

Box 30F A3
 16.5 →
 16.5 ←

Box 20F A3
 10.5 ←
 10.5 →

GEOLOGIST(S): *Das*
 DATE: 8/21/34

PROJECT NO: 667-11.22

LOG OF BORING NO. 16-84

PAGE 3 OF 3

GEOLOGIST(S): *WJ*

DATE: 8/21/84

PROJECT NO: 667-11.25

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
Box 3 of 3								21	---	<p style="margin: 0;"><i>Clay, light</i></p> <p style="margin: 0; text-align: center;">See previous page</p> <p style="margin: 0;">olive grey (5 Y 4/1) clay, light grey (M7), mod-high plast, some iron staining, mottles, trace of carb. material, floury texture.</p>
								22	---	
	30							23	---	
	-260		(1)				CL	24	---	
			A.O					25	---	
								26	---	
								27	---	
								28	---	
								29	---	
	76.0									
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. 16-86

GEOLOGIST(S): *WCS*
 DATE: 8/29/67

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
								21		
								22		
								23		
								24		BOXES 1-4 OF 8 WERE NOT FOUND
								25		
								26		
26.4 ↓	26.4 -28.5					30% SILT 70% SAND		27	SILTY CLAYSTONE, blue gray (S V 4/1), dis- is non-apparent, well weathered, mod friable, some iron staining so mottled, some calc. material esp. in top of interval, base of interval is highly fractured, undeterminable a geo, trace of calc material in fracture, some white noncalc mineralization. Same as above; flowy texture at top of interval.	
28.5 ↓	-33.2					30% SILT 70% SAND		29		
Box 5 of 8										

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. 16-86

PAGE 2 OF 5

GEOLOGIST(S): *W.S.*
 DATE: 8/29/89

PROJECT NO: 607-482

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	/ / / / /	See previous page
								32	/ / / / /	
	33.7 -34.0							33	/ / / / /	See to see claystone, olive gray (SY 4/1) mod. apparent bedding, mod. friability, trace of carb. material. Highly fractured core is broken up.
	34.0 -35.2							34	X X X X X	No samples
	35.7 -35.7							35	/ / / / /	See as above: not broken core
↑ 35.7	35.7 -38.5							36	/ / / / /	Top of interval: see as above
↓ 35.7				(2) 2.4				37	/ / / / /	@ 37 FT: clay/siltstone, olive black (SY 2/1), apparent horizontal laminae bedding, mod. weathered mod-spoor friability, some carb. material.
								38	/ / / / /	
	38.5 - 45.65			(2) 6.8				39	/ / / / /	38.5 - 41.5 - see as above, some coal material. Slab shows disturbed bedding, some possible burrows, thin interbeds of clay (horizontal, <1 in)

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. 16-86

PAGE 3 OF 5

GEOLOGIST(S): *LS*

DATE: *2/29/88*

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
	<i>33.5</i> - <i>45.5</i>							41	-	<p style="text-align: center;">See: previous page</p> <p style="text-align: right;">light olive-gray</p> <p><i>41.5 - 43.5</i>: SILTY & VFG-FG JACONSON SY 65 massive bedding (thin slab), well weathered, mod - poorly friable, mod - well sorted, sand fraction is higher FG near 43.5 FT</p> <p><i>43.5 - 45.65</i> SILTY CLAYSTONE, olive gray (5 y 4/1), non apparent bedding, well weathered, mod friable, trace iron staining as mottles, trace carb material, fracture at 60°</p>
				60°				42	-	
								43	-	
								44	-	
								45	-	
Box 7070 ↑ 45.45 ↓	<i>45.65</i> - <i>49.0</i>			70°		37% Silt 65% Clay		46	-	<p>Same as above: 70° fracture showing stickiness</p>
		(2) 3.6						47	-	
								48	-	
	<i>49.0</i> - <i>54.0</i>					63% Silt 35% Clay		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. 16-86

PAGE 4 OF 5

GEOLOGIST(S): *LD*

DATE: *2/29/67*

PROJECT NO: *472-1117*

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
						55% SILT 45% CLAY		51		at 50 FT: increase of clay fraction
						65% SILT 35% CLAY		52		at 52 FT: decreased clay fraction
								53		Slab shows - 60° fracture that has <1mm coal seam, bedding appears to show ^{possible} clay on fracture plane. Bedding on both of fracture is a thin part. Laminated, above fracture is distorted with clay and silt clasts. Another fracture at 40° w/ some organic material along fracture.
54.0	54.4	0.3	(2)			60% CLAY 40% SILT		54		
	55.5	0.9				60% CLAY 40% SILT		55		SILTY CLAYSTONE, olive gray (5 Y 4/1), non-affluent bedding, lightly weathered, mod-poorly friable, some carb. material, trace of iron staining as mottled
	55.5							56		Same as above
								57		
								58		NO SAMPLE
								59		
59.0	64.0	(2) 4.7								at 59' - 61': CLAYEY SILTSTONE, light olive gray (5 Y 6/1), non apparent bedding, highly weathered, mod-poorly friable, 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. 16-84

PAGE 5 OF 5

GEOLOGIST(S): *llj*
 DATE: *8/29/59*

PROJECT NO: *887-1127*

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
<i>Box 8 of 8</i>								61		<p><i>See previous page</i></p> <p><i>Light SILTY CLAYSTONE, olive gray (5Y 4/1), apparent massive bedding, well weathered, med. friable, some carb. material. Fluffy texture as base of interval.</i></p>
							62			
							63			
							64			
<i>640</i>	<i>END OF BOXES</i>							65		
								66		
								67		
								68		
								69		

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. 17-86

PAGE 1 OF 2

GEOLOGIST(S): DCB
 DATE: 2/23/89

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					>50% clay	CL			Clay, pale yellowish brown (10 YR 6/2), to grayish brown (5 YR 3/2), moderate plasticity (est.), some gravel and sand some silt, trace of roots in upper 5 ft. sand fraction increases from ~2 ft to ~12.5 ft. cg + vcg. slightly calcareous in interval from 5 ft to 6 ft.
	to	(2)						1		
	4.2							2		
								3		
								4		
	5.0							5		
	5.0							6		
	to	(1)						7		
	8.0							8		
	8.0							9		
	to	(1)								
	13.0									

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. 17-87e

PAGE 2 OF 2

GEOLOGIST(S): DCB
DATE: 8/23/87

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	2.0					>50'	CL			Clay as above
10ft Bot	4.0	(1) 1.8						11		
	12.0							12		
↑	13.0					>50' clay				
	13.0	N/D						13		Color grades to mottled yellowish gray (5 y 7/2) to light gray (N7) at 12.5 ft. possibly highly weathered clay stone.
14.0	14.0	N/D						14		Dominantly light gray (N7) below with 25% (13.0 ft).
	14.0	N/D						14		
	15.0							15		Claystone, light gray (N7), bedding not apparent, highly weathered, moderately friable, iron staining locally and on fractures, slight silt component.
	15.0	(1)						16		
	16.0	2.5						17		
	18.0							18		
	18.0	(1)						19		
	19.0	1.5						19		
	20.0							20		

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 20.0 ft.



ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 18-86

PAGE 1 OF 6

GEOLOGIST(S): *AA*

DATE: *8/11/59*

PROJECT NO: *627 122*

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							0	/ / / / /	<p><i>4.5 feet</i> Silty clay. fine yellowish brown (100% 4.5 ft). Est. plasticity mod. to high. Some gravel (to 3cm.) root material more common at top but present throughout interval. Some calcite clasts. Matrix mod. calcitic.</p>
		3.5 ⁽¹⁾				Clay > 50%	CL	1	/ / / / /	
								2	/ / / / /	
								3	/ / / / /	
	5.0							4	/ / / / /	<p>Silty clay. Mod. yellowish brown. (100% 5 ft) Est. plasti. Moderate Matrix very slightly calcitic.</p>
		(1) 1.9				Clay > 50%	CL	5	/ / / / /	
	6.5							6	/ / / / /	<p>No Sample</p>
	6.5							7	/ / / / /	
		0*						8	/ / / / /	
	10.3							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.

* Markers in this box were most likely not in their original positions.



ROCKY FLATS PLANT

FIGURE NO.

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.

NOTES:

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
10.3	10.5	0.2	0			CL	CL	10.5		No Sample
10.5	10.5	1.4 (1)	10.5			CL	CL	10.5		5.5% clay, fine yellowish brown (log 12). Est. plat. moderate some black carbonaceous material
11	11	0				CL	CL	11		5.5% clay, very pale orange to dk. yellowish orange. Est. plat. moderate. Matrix moderately to calcareous. Becomes non calcareous 5.5% clay (pale yellowish brown (log 12) in 2nd half of interval
13	13	0						13		No Sample
13.0	13.0	0						13.0		No Sample
14	14	1.8 (1)	14			CL	CL	14		Clay, pale yellowish brown (log 12). Est. plat. moderate to high. Some iron staining some silt.
15	15	0				CL	CL	15		
15.5	15.5	0				CL	CL	15.5		
16	16	1.1	16			CL	CL	16		Clay, dk. yellowish brown to dusky yellowish brown (log 12) Est. plat. moderate some silt.
17	17	0				CL	CL	17		
18	18	0				CL	CL	18		
18.0	18.0	4.8	18			CL	CL	18.0		Clay, some as above, lighter pale yellowish orange (log 16) also, some carbonaceous material.
19.5	19.5	2.4 (1)	19.5			CL	CL	19.5		
19.5	19.5	0						19.5		

Box 2 of 6

Box 1 of 6

Box 3

Box 4

Box 5

See next page for description.

DATE: 7/11/87
 GEOLGIST(S): GJT

LOG OF BORING NO. 18-86

PAGE 3 OF 6

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

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 3 of 6	19.5 to 20.5	1.5(1)				Clay > 50%	CL		/ / / / /	Silty clay. Yellowish gray (5Y 8/1) to grayish orange (10Yr 7/4). Est. plast. moderate. Some carb. material.
						Clay > 50%	CL	21	/ / / / /	Same as above.
		43(1)				Clay > 50%	CL	22	/ / / / /	
	23.0					Clay > 50%	CL	23	/ / / / /	Same as above grading to
		3.5(1)				Clay > 50%	CL	24	/ / / / /	Claystone. Pale yellowish brown (10Yr 6/2). Some iron staining. Highly weathered. Highly friable. No bedding evident.
Box 4 of 6	25.0					Clay > 50%	CL	25	/ / / / /	Silty claystone. Grayish orange (10Yr 7/4). Highly weathered. Highly friable. Bedding not evident.
	25.5	1.1(1)				"			/ / / / /	Highly friable. Bedding not evident.
	26.0	0.6(1)				"			/ / / / /	Same as above
		2.45(1)				"			/ / / / /	Same as above w/color change to Pale yellowish brown (10Yr 6/2).
	28.0 to 29.0					"			/ / / / /	Same as above. Some carbonaceous material @ bottom of interval.
	30.5	2.9(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.

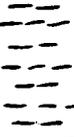
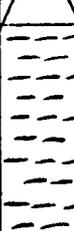
LOG OF BORING NO. 18-86

PAGE 4 OF 6

GEOLOGIST(S): *UAA*

DATE: *8/1/89*

PROJECT NO: *6,7-22*

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
	30.5	<i>2-ft</i>								See above page for description.
						<i>Clay > 80%</i>		31		Claystone. Pale yellowish brown (10yr 6/2). Highly weathered. Highly friable. No bedding evident. Some silt.
	32.0							32		*Claystone. Same as above.
	33.0	1.75				<i>Clay > 80%</i>		33		
Box 5 of 6			<i>19</i>					34		No Sample
		35.0						35		No Sample
		36.5	0					36		No Sample
		38.0	0					37		No Sample
		40.0	1.9				<i>Clay > 80%</i>	39		Claystone. Pale yellowish brown (10yr 6/2). Slightly weathered. Slightly friable. No evident bedding. Very distinct, <i>UAA</i> heavily iron stained vertical fractures and horizontal fractures.

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 lithologic log.

LOG OF BORING NO. 18-86

PAGE 5 OF 6

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

PROJECT NO: 447-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE OF INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION	
Box 5 of 6	40.5	.4 ⁽¹⁾				Clay >80%		40	---	Claystone. Lt. yellowish brown to brown. Mod. weathered. Slightly friable. Some black carbonaceous material.	
		2.25 ⁽¹⁾				Clay >80%		41	---	Claystone. Lt. brownish gray to brownish gray massive bed. (5yr 6/1 to 4/1). Moderately weathered. Slightly friable. Distinct horizontal and vertical fractures w/ heavy staining. Trace carb. material.	
								42	---		
		43.0							43	---	Same as above
			1.25 ⁽¹⁾				Clay >80%		44	---	
		45.5							45	---	
	46.0	.5 ⁽¹⁾				Clay >80%		46	---	Same as above	
Box 6 of 6	46.5	.3 ⁽²⁾				Clay >80%		46	---	Same as above.	
		.95 ⁽²⁾				Clay >50%		47	---	Same as above. Becoming slightly silty + slightly more carbonaceous toward bottom. Beginning to appear to have laminar bedding.	
	48.0							48	---	Same as above. Becoming silty claystone toward bottom. Some very obvious siltstones.	
		2.2 ⁽²⁾				Clay >50%		49	---		
	50.5							50	---		

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. 18-86

PAGE 6 OF 6

GEOLOGIST(S): *VAA*

DATE: *5/11/89*

667-
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
	<i>50.5</i>								//	<p><i>See previous page for description.</i></p> <p><i>Silty Claystone. Brownish gray (5yr 4/1). Bedding appears massive. Vertical fractures have some weathering. Slightly weathered, slightly friable. Some carbonaceous material. Siltier towards bottom of interval.</i></p>
		<i>(2)</i>			<i>Clay > 50%</i>		51	//		
							52	//		
<i>530</i>	<i>530</i>							53		<i>Bottom of Boxes</i>
<i>x</i>		<i>x</i>				<i>x</i>		54	<i>x</i>	<i>x</i>

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.



ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 19-86		PAGE | OF |		PROJECT NO: 667-11-22		DATE: 8/21/87		GEOLOGIST(S): D.C.B.		
TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
13.7	13.7	0				clay		14	claystone (U7), bedding not apparent, slight irregularity in color, localized iron stains and dark mineralization (possibly iron oxide)	
15.0	15.0	0						15	calcareous fracture silty clay	
16.5	16.5	0						16	214.5 ft. silty silt compact	
17	17							17	Bottom of Box 2 of 2	Bottom of Box 2 of 2

NOTES:

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

Box 2 of 2 was no more of Box 1 of 2, Box 2 of 2
 contains unmarked core possibly from Box 1 of 2.

LOG OF BORING NO. 18-86

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

USCS Symbol
 DATE: *8/1/89*

PROJECT NO: *667-11.22*

TOP/Bottom of core or box in feet	TOP/Bottom of core or box in feet	SAMPLE NUMBER	FEET OF CORE OF BOX	FEET OF CORE OF BOX	FRACURES PER FOOT	FRACURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0		?	?					1	2	Silty clay - moderate brown (5 YR 3/4) - some roots, trace of fine to coarse sand, grades to a silty clay. Dark yellowish brown (10 YR 4/2), trace of roots & sand, trace of calcareous material & fine gravel. - estimated plasticity = medium.
↓	TO			CL					2	2	
	5.0								3	2	
									4	2	
									5	2	
	5.0		?	?					6	2	silty clay - pale yellowish brown (10 YR 6/2) - estimated medium to high plasticity, trace of limonite staining & calcite as nodules
	TO			CL					7	2	
	10.5								8	2	
				CL					9	2	Fine sandy clay - pale yellowish brown (10 YR 6/2) - estimated medium to high plasticity, abundant limonite staining (dark yellowish orange (10 YR 6/6)) trace of organic material, & roots.
↑									10.5	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.

NOTE: Box is Badly Jumbled up & out of order. Sticks (out of place) are used as dividers & only two interval blocks are present.

LOG OF BORING NO. 20-86

PAGE 1 OF 3

GEOLOGIST(S): *WJ*
 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) 1.7				5% CLAY 40% SAND 10% GRAVEL		1	▽	GRAVELLY, SANDY CLAY, grayish orange (10 YR 7/4), mod. high plant, Sand is VFG-FG, max gravel size = 7mm, some silt, some very staining or mottles, some calc material, shaly
	2.0-4.0	∅						2 3	X	NO SAMPLES - a sample block is in the interval w/ only v. coarse gravel - is ^{is} representation of interval.
	4.0-6.5	(1) 0.5				10% CLAY 25% GRAVEL 15% SAND		4 5 6	▽ ▽ ▽ ▽ ▽ ▽	CLAYEY GRAVEL, matrix color is grayish orange (10 YR 7/4) ^{moderate} yellowish brown (10 YR 5/4), angular-sub angular, mod. poorly sorted, max size = 6mm, Sand is FG-MG, some calc material
	6.5-7.5	∅						7	X	NO SAMPLES
	7.5-12.5	(1) 0.2						8 9	CONCRETE CONCRETE	CONCRETE

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. 20-86

GEOLOGIST(S): *AW*
 DATE: *9/5/57*

PROJECT NO: *107-1-22*

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE OF INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
								11	CONCRETS	See previous page
								12		
	12.5-13.0		(1) <i>CRS</i>			10% SAND 20% CLAY		13			CLAYEY SAND, dark yellowish orange, sub- -subrounded, poorly graded, sand to VFG-FG abundant carb staining as in matrix
	13.0-14.7		<i>Ø</i>					14	X	NO SAMPLE
	14.7-16.1		(2) 1.5			30% SILT 70% CLAY		15	/ / / / /	SILTY CLAYSTONS, a yellowish gray (5 Y 6/1) at top grading to pale yellowish brown (10 YR 6/2), apparent massive bedding, highly weathered, mod - poorly sorted, abundant carb material at base of interval (trace of carb material at top), some carb staining as in matrix, top of interval shows sharp contact with sand (FG-MG), trace of sand at top of interval
	16.1-17.5		(2) 1.2	80°				16	- - - - -	
	17.5-19.0		ND (2) 1.4					17	- - - - -	Same as above (base of interval): fracture at ≈ 80° filled w/ calc. material
	19.0-20.4		ND 1.4					18	- - - - -	Same as above: no apparent fractures
								19	- - - - -	Same as above: light olive gray (5 Y 6/4) Some 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. 20-86

PAGE 3 OF 3

GEOLOGIST(S): *Ray*
 DATE: 9/5/89

PROJECT NO: *05-1127*

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
<i>Box 2042</i>									<i>20.4</i>	<i>See previous page</i>
								<i>21</i>	<i>No SAMPLE</i>	
<i>22.0</i>								<i>22</i>	<i>END OF BOXES</i>	
								<i>23</i>		
								<i>24</i>		
								<i>25</i>		
								<i>26</i>		
								<i>27</i>		
								<i>28</i>		
								<i>29</i>		

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. 21-86

PAGE 1 OF 8

GEOLOGIST(S): DCB
 DATE: 2/15/87

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE OF 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		<p>Gravelly Sandy Clay light brown (5YR 5/6), low plasticity. DCB</p> <p>No Sample</p>
	+0	0					2			
							3			
	4.0						4			
	4.0					CL		5		<p>Gravelly Sandy Clay light brown (5YR 5/6), low plasticity.</p>
							6			
		(1)					7			
	+0	.7					8			
	8.0						9			
	+0	(1) .8					10			
	10.5									

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. 21-86

PAGE 2 OF 8

GEOLOGIST(S): *DCB*
 DATE: *2/15/87*

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
	3.0 10.5	(1) .8				<i>20% clay</i>	<i>CL</i>			<p>As above</p> <p style="text-align: center;">11</p> <p style="text-align: center;">12</p> <p style="text-align: center;">13</p> <p style="text-align: center;">14</p> <p style="text-align: center;">15</p> <p style="text-align: center;">16</p> <p style="text-align: center;">17</p> <p style="text-align: center;">18</p> <p style="text-align: center;">19</p>
	10.5 7.0	(1) .7								
	13.0 13.0	(1) .8								
	15.0 15.0 15.5	(1) .2								
	15.5 7.0	(1) 1.9								
	18.0 18.0	ND								
	7.0 20.5									

Bor 1 of 7

Sandy Clay, very light gray (w/3) mottled dark yellowish orange (10 YR 6/6), low to moderate plasticity, some silt sand is disseminated throughout the upper part of this interval with short intervals (< 0.1 ft) of sand occurring locally.

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. 21-86

PAGE 4 OF 8

GEOLOGIST(S): DCB

DATE: 2/15/89

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
28.0 to 30.5	28.0 to 30.5	ND				> 20 clay				As above
30.5	30.5					> 50 silt		31		Interval grades to silty sandstone
32.5	32.5					> 50 clay		32		Silty sandstone, very light gray (NG) to grayish orange (10 YR 7/4), bedding appears to be horizontal (based on core breaks); well weathered, slightly friable local iron staining and dark mineralization (mg oxides?) occurs on partings.
32.5	32.5			85° ± 335°				33		
	to	ND						34		Interval grades to silty claystone.
35.0	35.0							35		Silty claystone, grayish orange (10 YR 7/4), bedding not apparent, well weathered, slightly friable, dark mineralization occurs on a fracture face at 33.5; abundant iron staining from 38 ft to 37 ft.
	to	ND						36		
	to	ND						37		Interval grades to claystone.
40.0	40.0							38		Claystone, medium light gray (NG), bedding appears to be horizontal (based on core breaks); weathered, slightly friable, significant silt fraction, localized occurrences of dark mineralization, probably carbonaceous.
								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. 21-86

GEOLOGIST(S): DCB
 DATE: 8/15/59

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 top 50.5	50.0					2-50%				As above
50.5	50.5							51		
50.5	50.5							52		Interval grades to silty sandstone at 51.5 ft. 50.5 ft. very light gray (N8), thin wavy bedding slightly friable, very fine grained well sorted.
	to	ND						53		Interval grades to silty sandstone at 52 ft. N5. It is fine, very light gray (N8), bedding not apparent, slightly friable.
	to	ND						54		
	55							55		
	to	ND						56		
	to	ND			3-50			57		Interval grades to silty claystone at 57 ft.
	to	ND						58		Silty claystone, light gray (N7), bedding is thin with slight dip to bedding not apparent, moderate to slight weathering, slightly friable, silt is disseminated throughout clay and as interfingered laminae slight up sand fraction as beds 1 ft. and disseminated locally.
	60							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.



LOG OF BORING NO. 21-86

PAGE 7 OF 8

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

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE OF INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
60.0 60.5	60.0 60.5					>50% clay				As above with abundant silt and sand.
60.5 ↓	60.5				~10°	>50% clay		61		At 60.5 silt, clay stone noticeably overlies a claystone. The unconformity is not borne out by the sequence at the top of the next box.
	to	ND			~10°	>50% silt		62		silt claystone, light gray (N7) bedding is thin < 2mm with slight dip to, not apparent, weathered, slight to moderate friability, some vfa sand, silt and sand are disseminated within the claystone and occur in discreet intervals.
	65.0							63		
	65.0							64		Interbedded siltstone and claystone
	to	ND						65		Siltstone, light gray (N7) to med. dark gray (N4) thin bedded < 2mm w/ slight dip, slightly weathered, slightly friable, clay defines bedding planes, significant fraction of vfa sand, carbonaceous mineralization occurs in bedding planes.
	67.0					>50% clay		66		Interval grades to claystone at ~66 ft.
	67.0							67		Claystone medium gray (N5) bedding slightly weathered, slightly friable, localized iron staining, some carbonaceous mineralization occurs on partings, moderate silt fraction
	to	YD						68		
	69.5							69		
69.5 ↑	69.5									
69.5 ↑	73.0									

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.

NOTE! MISHAP OCCURRED, BOX WAS DROPPED AND SCRAMBLED AFTER IT WAS LOGGED. CORE WAS REPACKED IN BOX ON BASIS OF LOG DESCRIPTION.



ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 21-86

PAGE 8 OF 8

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

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
	69.5									As Above
	to		ND		50			71		As above with increase in silt fraction from ~70.5 to ~71.2 ft. silt/clay define bedding - ~2mm thick.
								72		Claystone as above (reference interval 66 to 70.5 ft)
	73.0							73		Slickensides at ~72.6 ft. ~22° attitude.
	73.0							74		
	to		ND					75		
								76		Interbedded silt and claystone with claystone, light gray (N7), med. dark gray (N4), thin bedded ~2mm, slight dip, slightly weathered, slightly friable, localized iron staining.
								77		
	78.0	78.0						78		Bottom of Box 7 at 78.0 ft.
								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. 22-86

PAGE 2 OF 3

GEOLOGIST(S): UAA

DATE: 8/16/89

PROJECT NO: 657-122

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 of 3	10.0	1.85				Sand 75%	GC	11	0-0 0-10	Top 6 in. Heavy Sand + gravel Gravel predom. Mod. gray (1r5). Well graded (granules to 5cm) Subangular to sub rounded Sand v.f.g. to granules. (well graded) Some silt. Bottom of interval: Sand. ^{Very} Pale orange. (10yr 8/2). v.f.g. Some iron staining. Well sorted
	12.0							12		*Marker indicates sample was removed here. See
	13.0	25*				Sand 75%	GC	13		Same as above.
4.0	14.0							14		
Box 2 of 3		1.85				Clay 75%	CL	15	//	Silty Clay. Very pale orange to dk. yellowish orange (10yr 8/2 to 6/6). Mod. to high plast. Some iron staining. Trace Calcite, carbonaceous material.
	16.0							16	//	^{UAA} Same as above
		1.80				Clay 75%		17	//	Silty Claystone. Very pale orange to dk. yellowish orange (10yr 8/2 to 6/6). Mod. weathered. slightly to Slightly to mod. friable. Bedding not distinct. Some v.f.g. sand. Some iron staining. Trace Carb material.
	18.0					Sand 75%		18	//	Same as above
	19.0	1.10				Sand 75%		19	//	Same as above.
	19.7	.65			Clay 75%				//	Same as above.
	↓									See next page for descrip. of this 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. 22-86

PAGE 3 OF 3

GEOLOGIST(S): LAA

DATE: 8/16/53

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 2 of 3	19.7	1.36				Clay			[Diagonal hatching symbol]	Silty Claystone. (10yr 812 to 10yr 714). Mod. to mod. friable. Some iron staining. Some black carb. material. Some v.f.g. sand.
	21.0					Clay		21			Same as above
Box 3 of 3	23.0	1.1							[Diagonal hatching symbol]	Same as above
	24.0					Clay		24			No Sample
	26.0	0							[X symbol]	Bottom of Boxes
								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. 22A-86

PAGE 1 OF 1

GEOLOGIST(S): WAS
 DATE: 8/26/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE OF 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 - .40						CL	0	0	<p style="margin: 0;"><i>Sease WAS</i></p> <p style="margin: 0;">Generally clay, moderate sand (5 yr +/-), mod-low plast, some sand</p> <p style="margin: 0;">Clay, light olive-gray (5 y 6/1), mod-low plast, some carb. material becoming more abundant in lower 2 ft of interval, some iron staining as mottles, <i>Sease WAS</i>, trace of calcite,</p> <p style="margin: 0;">3.5-4.0 Same as above; less carb. material,</p>
Box 1 of 1		ND					1	1		
							2	2		
↑ 4.0							3	3		
								4	4	
								5	5	
								6	6	
								7	7	
								8	8	
								9	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. 23-86

GEOLOGIST(S): DCS
 DATE: 8/30/87

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
								11		Box 1 of 4 not in trailer, box 4 of 4 not in trailer. 2CB stone
								12		
12.6	12.6 to 14.0	ND				250+ clay		13		Clay, light gray (N7) bedding not apparent, weathered, slightly friable, calcite occurs as fracture filling, local iron staining, slight silt fraction.
	14.0 to 15.0	ND		40°				14		
	15.0 to 16.0	ND						15		claystone as above with iron staining on fractures and moderate amount of iron oxide mineralization.
	16.0 to 17.0	ND		60°				16		
	17.0 to 17.3	ND		90°				17		
	17.3 to 18.0	ND						18		
	18.0 to 19.0	ND						19		
	19.0 to 20.8	ND		12°						

Erase 8/30/87 correct interval marks error

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. 23-876

GEOLOGIST(S): DCB

DATE: 8/30/89

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
20.2	19.0 to 20.8	ND				75% clay				Claystone as above
20.8	20.8 to 22.0	ND						21		
22.0	22.0 to 23.2	ND						22	max	Slickensides at ~ 21.9 ft. Attitudes 50° and 60°; iron staining and possible Mn oxides on surface.
23.2	23.2 to 23.8	ND						23		Carbonaceous mineralization (low grade coal) at ~ 22.8 ft.
23.8	23.8 to 25.5	ND						24		
25.5	25.5 to 27.0	ND						25	min	Slickensides at ~ 25 ft. Attitude DCB -45°
27.0	27.0 to 28.6	ND						26		
28.6	28.6 to 28.6	ND						27		
								28	min	Slickensides at 28.2 ft, Attitude 30°.
								28	min	Slickensides at 28.6 ft, Attitude ~30°.
								29		Bottom of Box 3 of 4 at 28.6 ft. Box 4 of 4 not in trailer.

Box 3 of 4
Box 4 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. 23-84

PAGE 1 OF 10

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

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
								31 32	X	No Sample
33.0 ↓ Box top 10	33.0 to 34.8 34.8 to 36.6 36.6 to 38.0 38.0					250% clay		33 34 35 36 37 38 39	---	<p>Claystone light gray (N7) to yellowish gray (5Y 8/1), bedding not apparent, well weathered, slightly friable, slight silt fracturing, some dark mineralization - probably carbonaceous occasional iron stains and calcareous bodies < 1mm in diam.</p> <p>As above slabbled section exhibits multiple very fine healed fractures.</p> <p>Claystone light gray (N7), bedding not apparent, weathered, slightly friable, vertical fractures and ~250 fractures with iron staining slightly calcareous in places.</p>
	to 40.9			25° 90°		250% 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.

Box starts at 33.0 ft.



ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 23-86

PAGE 2 OF 10

GEOLOGIST(S): DCB
 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 10	38.0 to 40.9					250 μ clay		41	---	As above, exterior of core has a lumpy appearance
	40.9 to 42.0							42	---	
	42.0 to 43.0							43	---	From 42.7 to 43.0 interval is highly weathered.
	43.0 to 43.0							44	---	
Box 2 of 10	43.0 to 45.9	(1)						45	---	
	45.9 to 46.9	ND						46	---	Claystone, medium light gray (NG) to very light gray (NS), bedding not apparent possible soft sediment deformation or bioturbation well weathered, moderately friable, abundant carbonaceous mineralization, some iron staining.
	46.9 to 48.2	ND						47	---	
	48.2 to 48.2	ND		90°				48	---	
	48.2 to 50.1	ND						49	---	Claystone, medium gray (NG), bedding not apparent well weathered, slightly friable abundant iron staining on bedding plane partings and fractures, slickensides off ~ 49.6 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. 23-89

PAGE 3 OF 10

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

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
50.1 54.4 58.9 60.9 50.1 51.7 54.4 55.9 57.3 58.9 60.9	50.1							50.1		As above, slickensides at ~50.1 to 50.4 slickensides at ~52.5 ft. Claystone, light olive gray (5 Y 6/1), bedding not apparent, weathered, slightly friable, trace of silt slickensides at ~55.4 ft. slight amount of iron staining. No Sample Claystone, light gray (N2) to medium dark gray (N4), bedding not apparent, well weathered slight to moderate friability, moderate silt fraction, slight iron staining and carbonaceous mineralization.
	to	ND						51		
	51.7							52		
	51.7							53		
	to	ND						54		
	54.4							55		
	54.4		ND					56		
	to	0						57		
	57.3							58		
	57.3		ND					59		
58.9										
58.9										
to	ND									
60.9										

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. 23-86

PAGE 4 OF 10

GEOLOGIST(S): **OCB**
 DATE: **8/17/87**

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
	58.9 to 60.9	ND								As above
Box 3 of 10 → Bot	60.9 to 62.7	ND				>50% silt		61		Clayey siltstone, light gray (N7), bedding not apparent (massive?) slightly friable, at OCB iron stain at ~62 ft with possible carbonaceous mineralization.
	62.7 to 64.5	ND						62		Interval grades to a silty Claystone at 62.7 ft, iron stains absent.
	64.5 to 66.0	ND						63		
	66.0 to 67.7	ND						64		
Box 4 of 10	67.7 to 69.3	ND						65		Interval grades to siltstone at ~66.0 ft.
	69.3 to 71.5	ND						66		Siltstone, light gray (N7), bedding not apparent (massive?) slightly friable, slight clay fraction, slight amount of carbonaceous mineralization.
								67		
								68		stickerside at ~68.5
						>50% clay		69		Interval grades to Claystone at ~68.5 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. 23-86

PAGE 5 OF 10

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

PROJECT NO: 667-1632

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 4A 10	70.5 to 70.5	ND				MS: CLy		71	---	some carbonaceous mineralization slickensides at ~69.8 ft.
								72	---	
		(1) 2.0						73	---	
								74	---	
								75	---	
Box 5A 5 ↓	75.5 to 75.5	ND						76	---	Slickensides at ~77.0 ft As above with an increase in the silt fraction from ~77.4 to 80.5 and color grades to light gray (N7)
							77	---		
							78	---		
							79	---		
							80.5	---		

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. 23-876

PAGE 6 OF 10

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

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				
Bot 5 of 10	77.9 to 80.5	ND		40°										
	80.5 to 81.0	ND												
	81.0 to 83.2	ND												
	83.2 to 84.0	ND												
Bot 6 of 10	85.5 to 87.4	ND												
	87.4 to 89.2	ND												
	89.2 to 90.5	ND												

claystone light olive gray (5-10%)
 bedding not apparent
 friable, occasional small shaly
 moderate silt in matrix.

claystone
 as above
 slickensides at ~ 85.2 with
 40° strike.
 Irregular body of vfg sand
 at ~ 85.9 ft.

claystone
 as above with irregular body of
 vfg sand at ~ 89.5.

V. 117
 003
 misplace
 descri

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. 23-86

PAGE 7 OF 10

GEOLOGIST(S): DCB

DATE: 2/17/89

PROJECT NO: 667-1.2

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
Box 6 and 10	89.2 to 90.5	ND				>500. clay				<p>As above with moderate amount of vfg sand at ~ 90.6 ft.</p>
	90.5 to 91.2	ND						91		
Box 3	to 93.6	ND						92		
	93.6 to 95.5	ND						93		
Box 10	95.5 to 97.4	ND			30°			94		
	97.4 to 99.3	ND			30°			95		
Box 2 and 10	99.3 to 100.5	ND						96		<p>claystone as above, vfg sand is absent, occasional iron staining and carbonaceous mineralization, mineralized body at ~ 96 ft - some white bladed to xstals (gyp?) underlain by gray granular mass, Fe oxide and possible mg oxide stains surround mineral body.</p> <p>Fractures with paint slickensides at ~ 97 ft. and 99.1 ft.</p>
								97		
								98		
								99		

NOTES: General USCS is modified for this log as follows:
 Material amounts are estimated by % volume instead of % weight.
 (1) Body 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. 23-86

GEOLOGIST(S): DCB

DATE: 8/12/87

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 7 of 10	100.3 to 100.5	ND				>50% clay				<p>Claystone, light olive gray (5 Y 6/1), bedding not apparent, slightly friable, slight to moderate silt fraction, occasional iron staining and carbonaceous mineralization.</p> <p>- Lense of fs sand at ~ 102 ft. ~ 2 mm in thickness.</p> <p>Interval grades to clayey siltstone at ~ 102.5 ft.</p> <p>Clayey siltstone, light olive gray (5 Y 6/1), bedding is not apparent, slightly friable, slight fraction of vfg sand locally, occasional iron staining and carbonaceous mineralization.</p> <p>DCB Clayey siltstone, light olive gray (5 Y 6/1), bedding is not apparent, slightly friable, slight fraction of vfg sand locally, occasional iron staining and carbonaceous mineralization. Increase in clay fraction below 105 ft.</p> <p>Silty claystone, light olive gray (5 Y 6/1), bedding not apparent, weathered, slightly to moderately friable, occasional iron stains and carbonaceous mineralization.</p>
	102.3 to 102.3					>50% silt		101		
	103.6 to 103.6							102		
	105.5 to 105.5					>50% clay		103		
	107.5 to 107.5	ND						104		
	109.9 to 109.9	0						105		
								106		
								107		
								108		
								109		

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. 23-82

PAGE 9 OF 10

GEOLOGIST(S): DCE
 DATE: 2/18/87

PROJECT NO: 667-11.27

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 10	109.1 to 110.5	ND				50% silt				Claystone, light olive gray (5/6/1), bedding not apparent, slightly weathered, slightly friable occasional carbonaceous mineralization, slight silt fraction, color varies to medium dark gray (N5).
	110.5 to 111.6	ND						111		
	111.6 to 113.4	ND						112		
	113.4 to 113.4	ND				75% silt		113		
	113.4 to 115.5	ND						114		
	115.5 to 115.9	(1)				75% Clay		115		
	115.9 to 117.8	ND						116		
	117.8 to 119.4	ND						117		
	119.4 to 120.5	ND						118		
									119	

NOTES: ^{DCE} 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. 23-86

PAGE 10 OF 10

GEOLOGIST(S): DCB
 DATE: 8/13/87

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
	117.9 to 120.5	ND				750+ Chy				A ₂ above - silty claystone slickensides at ~122.7 Bedding appears to have slight dip (based on core breaks)
	120.5 to 121.1	ND					121			
	121.1 to 122.9	ND					122			
	122.9 to 124.9	ND			-10°		123			
	124.9 to 125.5						124			
	125.5 to 126.3						125			
	126.3 to 127.8						126			
	127.8 to 129.5						127			
	129.5 to 130.5						128			
	130.5						129			

Box #10 of 9 of 10
 ↑
 Box 10 of 10
 ↓

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 10 of 10 at 130.5 ft.



ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 24-86

PAGE 1 OF 2

GEOLOGIST(S): DCE
 DATE: 2/14/89

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					>50% sand	GC	0	0.0	Clayey Gravel, light gray (N7), mottled to pale yellowish brown (10 YR 6/2) to pale brown (5 YR 5/2), angular to subrounded, poorly graded, max size 7mm, some silt and a trace of vfg sand.
	to	ND						1	1.0	
	2.5							2	2.0	
	2.5						CL	3	3.0	
	to	(1)						4	4.0	Caliche and gravel, white (N9),
	5.0							5	5.0	
	5.0							6	6.0	No Sample
	7.0							7	7.0	
	7.0	ND				>50% clay	CL	8	8.0	Gravelly sandy clay, light gray (N7) mottled dark yellowish gray (10 YR 6/6), low to moderate plasticity, max gravel size is 5mm. sand is vfg to cg. Claystone, abundant, appears highly weathered, slightly to moderately friable, caliche as fracture filling, localized carbonate mineralization and iron staining.
	to	ND						9	9.0	
	8.9							10.0	10.0	

Box top!

1.564
2/14/89 (N7)

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.



GEOLOGIST(S): DCB

DATE: 8/14/87

PROJECT NO: C67-1122

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 ↑ 12.0	2.8 to 10.6	ND				5-15 50%			---	As above
	10.6 to 12.0	NO						11	---	
								12		Bottom of box top of 12.0 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.



LOG OF BORING NO. 25-86 A

PAGE 1 OF 8

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
21.3								21		Begin Core at 21.3
21.3	21.3					> 80% clay		22		Claystone light gray (N7), bedding not apparent, moderately weathered, slightly friable, localized iron stains and carbonaceous mineralization.
	to	ND						23		Claystone as above with color change to grayish orange (10 YR 7/4) and light gray (N7), carb. minerals absent, iron stains locally and on fractures
	23.10							24		
	23.10		ND					25		
	25.0							26		Claystone as above
	25.0							27		Interval grades to light gray (N7), iron staining on fractures, occasional carb. mineralization
	to	ND						28		
	27.25							29		Two irregular bodies of calcareous mineralization occur at ~29.6 ft.
	27.25									
	to	ND								
	29.82									
	29.82-107.9									

Box 1 of 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. 25-86A

PAGE 2 OF 8

GEOLOGIST(S): *VCS*

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
<i>30.0</i>	<i>30.0</i>					<i>> 50 clay</i>				<i>claystone as above, calcareous mineralization is absent.</i>
<i>30.8</i>	<i>30.8</i>							<i>31</i>		<i>claystone as above, slicken-sides with iron staining at ~31.4 ~ 60° attitude.</i>
	<i>+</i>	<i>ND</i>						<i>32</i>		
	<i>32.55</i>							<i>33</i>		
	<i>32.55</i>							<i>34</i>		
	<i>+</i>	<i>ND</i>						<i>35</i>		<i>claystone as above Irregular calcareous body at ~34.8 ft.</i>
	<i>34.4</i>							<i>36</i>		
	<i>34.4</i>							<i>37</i>		
	<i>+</i>	<i>ND</i>						<i>38</i>		
	<i>35.2</i>							<i>39</i>		
	<i>35.2</i>									
	<i>+</i>	<i>ND</i>								
	<i>38.0</i>									
	<i>38.0</i>									
	<i>+</i>	<i>ND</i>								
	<i>39.95</i>									

LSat 2 of 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. 25-86A

PAGE 3 OF 8

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
39.5	40.0	ND				25% clay				Claystone light gray (N7), bedding not apparent, slightly weathered, slightly friable, iron staining on fractures and locally.
40.3	to	ND					41			
42.2	42.2						42			
43	to	ND					43			
44.0	44.0			80°			44			
45	to	ND		90°			45			
45.5	45.5						46			
46.25	46.25						47			
48	to	ND					48			
48.25	48.25						49			
50.10	to	ND							Interval grades to - Claystone, medium dark gray (N4), 1/2" bedded, not apparent, slightly weathered, slightly friable, bedded carbonaceous mineralization and iron staining typically on fractures, slickenside at 48.6 ft with ~40° attitude.	

Bot 3' core

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. 25-86 A

PAGE 4 OF 8

GEOLOGIST(S): DCB

DATE: 8/18/87

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
50.1	50.1	ND				>50% clay				As above - claystone
↓	to	(1) .7								
	51.0							51		
	to	ND								
	52.0							52		
	to									
	53.95							53		sl. concave at ~53.0 ft., concave surface
	to	ND								
	56.3							54		
	to	ND								
	56.5							55		
	to	ND								
	57.8							56		
	to	ND								
	59.65							57		
	to	ND								
	59.7							58		
	to	ND								
	62.8							59		
	to	ND								

Box 4 of 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. 25-86A

PAGE 5 OF 8

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
	59.7					>50% clay				(cont'd from previous page) not apparent, slightly friable, occasional iron stain and carbonaceous mineralization, slight to moderate silt fraction.
	to	ND						61		
	62.0							62		
	62.0									
	to	NI						63		
	64.0							64		
	64.0									
	to	(1) 2.0						65		
	66.0							66		
	67.2							67		
	67.2	.35								
	67.5					150% clay				slickensides at ~66.8 ft, attitude ~60°.
	to	ND						68		
	68.2									
	to	ND						69		Internal grades to silty claystone below 67.5'. Silty claystone light gray (N7), bedding not apparent, slightly friable, slight to moderate silt fraction.
	69.9					350% silt				Internal grades to sandy siltstone below 69.9'. Silty sand, light gray (N7).

Box 5 of 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. 25-82A

PAGE 6 OF 8

GEOLOGIST(S): DLB
 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
69.9 to		(2) 2.0			25° 10'	>50% silt		71	---	bedding not apparent, to thin (2mm) soft sand, deformation with moderate dip, slightly friable, increase in sand compaction with depth.
73.0 73.0 to		?			-10°	>50% silt		72	---	Sandstone, light gray (N7), thin bedded (2mm), slight dip, slightly friable, moderate silt compaction.
73.8 74.0 to		?					73	---		
74.0 74.0 to		?				>50% silt		74	X	No Sample
74.7 74.7 to		NO						75	---	Same sandstone as above, interval grades to clayey siltstone. Clayey siltstone, light gray (N7) to medium light gray (N6), bedding not apparent, slightly friable, localized carbonaceous mineralization, slight silt fraction.
76.4 76.4 to								76	---	No Sample
78.0 78.0 to		NO					77	X		
79.4 79.4 to		NO						78	---	A siltstone, light gray (N5) to medium light gray (N6), thin bedded (2mm) interbedding clay laminae, bedding is disturbed - possible soft sediment deformation or bioturbation, some carbonaceous mineralization and possible iron oxides.
81.2 81.2 to		NO					79	---		

8/21/89
DLB
11-4th deck
error

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

? - Interval blocks don't add up,



ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 25-86 A

GEOLOGIST(S): DCB

DATE: 8/21/89

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
80.2 Box 8	79.4 to	ND				>50% silt				slight v. g sand fraction.
81.2	81.2							81		
81.2	81.2 to					>50% clay				Claystone, medium dark gray (N4), bedding not apparent, slightly friable abundant carbonaceous mineralization (discontinuous coal beds), slight to moderate silt fraction, slight v. g sand fraction.
	83.3 83.0 to							82		
	84.65 84.65 to							83		
	86.7 86.7 to							84		Claystone, light gray (N7), bedding not apparent, slightly friable, localized carbonaceous mineralization, moderate silt fraction.
	88.0 88.0 to							85		
	90.2				15°			86		
								87		
								88		Bedding becomes apparent from 88.0 to ~ 89.5 ft. - thin bedded (~2mm) slight dip, interbedded silt and clay which exhibits soft sed. deformation.
								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. 25-26 A

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

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
90.0	90.0									Claystone as above bedding apparent at 90.6 ft. < 2mm thick , steeply dipping - may be result of soft sed. deformation
↓	to	ND			70°			91		
	91.2							92		
	91.2	ND						93		
	to	ND						94		
	93.0							95		
	93.0							96		
	to	ND						97		
	95.3							98		
	95.3							99		
	to	ND								Bottom of Box 8 of 8 at 98.0 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. 25-86

PAGE 2 OF 7

GEOLOGIST(S): *WJ*
 DATE: 8/26/89

PROJECT NO: 442-1122

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 5 12.6 →	11.3-12.6	(1) 1.3						11		Top of interval: Craystone, very light quartz (NB), non-apparent bedding. Some well weathered, most friable. Some iron staining as mottling, some silt, trace of Mn staining, trace of calcite at 10.5 FT.
		(2) 0.6						12		Same as above: calcite material, abundant micro fractures
Box 2 of 5 Begins at 54.3 41.6 in same hole								13		See page 3 - Box 2 of 5 of same hole begins at 50.3 FT 41.6
								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. 25-86

PAGE 3 OF 7

GEOLOGIST(S): *Day*
 DATE: *8/29/87*

PROJECT NO: *627-1122*

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		See page 2 - there is a box 1 of 5 that is from 0.0 - 12.6 of same hole
41.6 ↓	41.6 - 43.7	(2) 1.5						42		CLAYSTONE, light grey (N7), non apparent bedding, well weathered, mod-poorly friable, some iron staining as mottles increasing at base of interval, trace of silt
	43.7 - 45.0	(2) 1.6					43		See as above: some silt, trace iron staining NOTE: core is cement w/ iron stained mud	
	45.0 - 46.6	(2) 1.2		50-80°				44		Top of interval: same as above, fractured at 50-80°
Box 1 of 5	46.6 - 47.0	0.3						45		Bottom 3.0 of interval: same as above light brown (5 YR 5/6), abundant iron staining and concretions, planar texture
	47.0 - 49.0	(2) 1.65						46		See as above
	49.0 - 50.3	(2) 1.4						47		See as above: consolidated texture
								48		Base of interval: same as above, yellowish grey (5 Y 8/1), iron staining as mottles
								49		See as above: fractured at 45°, 60°, 70° - showing slickensides, iron staining along fracture faces

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. 25-86

PAGE 3 OF 4
4 7

GEOLOGIST(S): *Day*
DATE: *8/26/89*

PROJECT NO: *667-1122*

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
50.3										See previous page
50.3 ↓	50.3 -51.6			70°				51		Claystone, light olive gray (5 Y 6/1), massive ^{bedded} , well weathered, and friable, some iron staining as mottled, 70° fracture base of interval has some fracture, trace of silt
	51.6 -53A							52		Same as above: brownish gray (5 YR 4/1), trace of carb. material
	53A -55.1							53		Same as above:
	55.1 -56.6			50°				54		Same as above:
	56.6 -59.0							55		Same as above: some carb. material, coal seam (2-4 mm) (horizontal), fracture at 50°
	59.0 ↑							56		Same as above: very highly weathered
59.0 ↓	59.0 -61.6	(2) 1.5						57		Same as above: olive gray (5 Y 4/1),

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. 25-86

PAGE ~~4~~ OF ~~6~~
5 7

GEOLOGIST(S): *Jay*
DATE: *8/26/59*

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
	<i>59.0</i> 61.9 62.7							61	---	
Box 3 of 5	<i>61.6-64.6</i>					<i>30% SILT 70% CLAY</i>		62	/ / / / /	<i>SILTY CLAYSTONE, light olive gray (5 Y 6/1), massive bedding, ^{with somewhat laminar} highly weathered, mod-poorly friable, some carb material. Trace of iron staining as weather, possible vertical fracturing.</i>
		<i>(2)</i>						63	/ / / / /	
		<i>1.7</i>						64	/ / / / /	
								65	/ / / / /	
	<i>64.6-66.6</i>					<i>40% SILT 60% CLAY</i>		65	/ / / / /	<i>Same as above: higher silt fraction</i>
		<i>(2)</i>						66	/ / / / /	
	<i>66.6-69.1</i>					<i>20% SILT 80% CLAY</i>		67	/ / / / /	<i>Same as above: lower silt fraction</i>
		<i>(2)</i>						68	/ / / / /	
		<i>1.5</i>						69	/ / / / /	
	<i>69.1-71.6</i>							69	/ / / / /	<i>(or possibly clay) SANDY CLAYSTONE, moderate yellowish brown (10 YR 5/4), bedding non-apparent, highly weathered, mod friable, sand is Fg-Gs.</i>
		<i>(2)</i>							/ / / / /	<i>Some gravel (max size = 7mm), trace of calc material.</i>
		<i>1.6</i>							/ / / / /	<i>NOTE: This interval seems to be out of place compared to above CLAYSTONES.</i>

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. 25-86

PAGE 7 OF 7
6 7

GEOLOGIST(S): *[Signature]*
DATE: 8/28/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
								71		See previous page NO SAMPLE
71.6	71.6 - 74.0							72	X	CLAYSTONE, olive gray (S Y 4/1), apparent massive bedding, highly weathered, mod - poorly friable, some silt, trace of carb material.
							73			
74.0	74.0 - 75.8	(2)	1.75			30% SILT 70% CLAY		74		SILT CLAYSTONE, light olive gray (S Y 6/1), massive bedding, highly weathered, mod - poorly friable, some trace of carb material.
75.8	75.8 - 77.6	(2)	1.90			30% SILT 70% CLAY		75		Same as above; trace of iron staining as mottles, increased silt fraction at base of interval
							76			
77.6	77.6 - 79.2	(2)	1.85			45% SILT 55% CLAY		77		Same as above; decreased silt fraction at base of interval
							78			
79.2	79.2 - 80.5	(2)	1.55			30% SILT 70% CLAY		79		Same as above; some 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. 75-86

PAGE 4 OF 7
7 7

GEOLOGIST(S): *AS*
DATE: 3/24/89

PROJECT NO: 467-1122

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% CLAY SILT 70% CLAY				
Box 4 of 5 ↑	80.5 -81.1	(2) 0.55						81	---	See previous page CLAYSTONS, light olive gray (5 Y 6/1), non-apparent bedding, well weathered, mod-poorly friable, some carb material, Some iron staining as mottles.
	81.1 -82.6	(2) 1.25						82	---	
82.6 ↓	84.4 -84.4	(2) 1.0						83	---	TOP 8m: CARBONACEOUS CLAYSTONS, olive black (5 Y 2/1), laminar bedding at a 15°, well weathered, mod friable, some coal beds x 1mm - 5mm, some silt.
	84.4 -85.6	(2) 1.3						85	---	Same as above: olive gray (5 Y 4/1) Trace of iron staining as mottles
Box 5 of 5 ↑	85.6 -86.0	(2) 0.4						86	---	Same as above: less carb. material and increased silt at base of interval
	86.0 -89.6	(2) 1.7						87	---	Same as above: increased silt at base of interval
								88	---	
								89	---	
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. 25-86

PAGE 1 OF 1

GEOLOGIST(S): GAA

DATE: 5/24/57

PROJECT NO: U3-422

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0					Gravel ~48% Clay ~25%	GC	1	0 0 0 0	Clayey Gravel. No predom. color to gravel. Angular to subrounded. Mod. well graded. Max. size 4cm. Matrix very pale orange to grayish orange. (10yr 2/2 to 7/4). Est. plast. Mod. Some sand, v.f.g. to v.c.g. Some silt. Some CaCO ₃ .
	1.5									
	2.0							2	X	No Sample
	3.2					Clay ~55% Gravel ~40%	GC	3	0 0 0	Clayey Gravel. Mod. No predom. color. Sub angular to sub rounded. Mod. to well grad. Max. size 4cm. Matrix dusky brown (5yr 2/2). Est. plast. mod. Some silt. Trace sand (v.f.g.). Trace CaCO ₃ in matrix.
	4.5							4	X	No Sample
	7.5					Clay 75%	CL	5	1 1 1 1	Sandy Clay and silt. White to dk. yellowish orange (10yr 6/6). Est. plast. low. Sand v.f.g. to v.c.g. well graded. Sub rounded. Abundant CaCO ₃ . Some gravel (to 3cm.) Angular to sub angular. Some silt.
								6	1 1 1 1	
								7	1 1 1 1	
								8	1 1 1 1	
								9	1 1 1 1	
								3		Bottom of Box.
								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. 25A-86

PAGE 1 OF 3

GEOLOGIST(S): DCB

DATE: 8/24/86

PROJECT NO: 67-11.32

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
	X									Core Begins at 1.0 ft.
1.0	1.0					>50% sand	GC	1	2 0 0	Gravel dominantly very light gray (NS) to white (Nq), matrix is pale yellowish brown (10 YR 6/2) subangular to subrounded, moderately graded, max. size 7cm, some clay, calcareous.
	to	(1) 1.0						2	1 0 0	
	3.0							3	0 1 0	One small cobble with calcareous rind.
	3.0						GP	4		
	to	<.1						5		
	5.0						GP	6	1 0 0	One large gravel with calcareous rind.
	5.0							7		
	to	<.1						8		
	6.0							9	0 0 0	Four medium to large Gravel. Gravel white (Nq) to medium gray (Ns), subangular poorly graded, max. size 6cm, silty clay coating on gravel is calcareous.
	6.0							10		
	to	.3						11		
	8.5							12		
	8.5							13		
	to	0						14	X	No Sample
	10.5									

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. 25A-86

PAGE 3 OF 3

GEOLOGIST(S): DCB
 DATE: 8/24/59

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
	19.5 20.5	ND				v soil clay			---	Claystone As above
	20.5 21.0	(1) .7						21	---	
	21.0 22.5							22	---	
	22.5 23.0							23	---	

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. 26-87

DATES DRILLED:
 ELEVATION:
 GEOLOGIST(S): DCB
 DATE: 7/25/59
 CHECKED BY:

USGS Symbol
 DATE:

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN LOG (INTERVAL)	SAMPLE NUMBER	FEET OF CORE IN BOX	FEET OF CORE IN LOG	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0		(1)					> 50% Gravel	0	-	Gravel, medium gray (NG) and very light gray (NS), angular to subangular, moderately graded, max. size, 6 cm., some caliche, silt and trace of clay.
↓	to		.85						1	0	
	1.5								2	0	
	to		(1)						3	0	
Box top 2	1.5								4	0	Caliche, white (NG), friable, trace of gravel.
	to		.8						5	0	
	4.5								6	0	Sand, some grayish orange (10 VR 7/4), subangular to subrounded, bedding not apparent, highly weathered, moderately friable, very fine to fine grained, poor to moderate sorting, significant amount of caliche, trace of silt and gravel.
	4.5		(1)						7	0	
	to		1.85						8	0	No Sample
	7.0								9	0	
	7.0	0									
	9.0										
	9.0	ND	GP					> 50% Gravel	11.0	0	Gravel, medium light gray (NG), subangular to subrounded, poorly graded, max. size 6 cm., some caliche and sand.

NOTES: General: The USGS is modified for this log as follows:
 Material amounts are estimated by percent volume instead of percent weight.
 (1) 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 50-150 cpm
 BP 50-200 cpm

LOG OF BORING NO. 26-86

DATES DRILLED:
 ELEVATION:
 GEOLOGIST(S): DCJ
 DATE: 7/25/89
 CHECKED BY:

USGS symbol
 DATE:

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN INTERVAL	SAMPLE NUMBER	FEET OF CORE	FEET OF CORE OF DATE OF RUN	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	9.0 to 11.0		ND	GP						0-0	See previous page.
150x 10x 24	11.0 to 12.0		(2) 1.3					750 Clay	11		Claystone mottled yellowish gray (5 x 8/1) and grayish orange (10 x 7/4), bedding not apparent.
	12.0 to 14.0		(1) 1.6						12		highly weathered moderately friable, calcareous, caliche occurs as isolated bodies within rock, localized iron staining and possible mg oxide mineralization.
									13		
									14		

NOTES: General: The USGS is modified for this log as follows:
 Material amounts are estimated by percent volume instead of percent weight.
 (1) 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 50-150 cpm
 34 50-200 cpm

LOG OF BORING NO. 26-86

PAGE 1 OF 1

GEOLOGIST(S): DCB

DATE: 2/30/89

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
								11		Box 26-86 lot 2 not in trailer.
								12		
								13		
								14		
	14.0					>50% clay		14	---	Claystone very light gray (N3), bedding apparent, moderately weathered, slightly friable, trace of silt, local iron staining, slight iron oxide mineralization.
	to	X117						15	---	
	15.2							16	---	
	15.8							17	---	
	to	ND						17	---	Bottom of Box 2 of 2 at 17.0 ft.
	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. 27-86

PAGE 1 OF 3

GEOLOGIST(S): UAP

DATE: 12/1/89

PROJECT NO: 65-1122

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					Gravel >50% Clay ≈ 30%	GC	1	0 0 0 0 0 0 0 0 0 0	Clayey gravel. Med. gray (N3). Angular to sub-rounded. Well graded. Granules to 6.5 mm. Matrix sandy clay. Mod. brown (5yr 3H). Some sand. v.f.g. to v.e.g. Some CaCO ₃ .	
	2.0	.9(1)				Gravel 75% Clay ≈ 30% Silt & sand ≈ 30%	GC	2 3	0 0 0 0 0 0 0 0 0 0	Same as above. Silty clay matrix, some sand.	
	4.0	1.8(1)				Gravel ≈ 50% Caliche ≈ 35%	GC	4 5	0 0 0 0 0 0 0 0 0 0	Gravel in Caliche matrix. Gravel as above. Matrix very pale orange to white (10yr 8/2 to N9). Some silt and sand.	
	5.7	1.1*				Gravel 75%		6	0 0 0 0 0 0 0 0 0 0	* This interval consists only of a few pieces of sandy, clayey gravel. Not enough sample to characterize interval.	
	7.0	0						7	X X X X X X X X X X	No Sample	
	8.0	.4(1)				Gravel >25%	GC	8	0 0 0 0 0 0 0 0 0 0	Gravel. med. dk. gray (N4). Angular to sub-rounded. Poorly graded. Max. size ≈ 5 cm. Some sand + clay.	
	8.8	1.7(2)				Clay ≈ 75%	CC	9	0 0 0 0 0 0 0 0 0 0	Clay. Very lt. gray (N3) to grayish orange (10yr 7H). Est. plast. Mod. to high. Some gravel. Granules to 2 cm. Angular to sub rounded. Thin caliche areas (2 cm). Trace sand + silt.	
	10.8.4										

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. 27-86

PAGE 2 OF 3

GEOLOGIST(S): *LAN*

DATE: *3/21/89*

PROJECT NO: *57-1122*

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	8.8 ↑								-	See previous page for description of this interval.
	10.8					Clay > 80% CL		11	-		Clay, very pale orange (10yr 8/2) to grayish orange (10yr 7/4). Est. Plast. mod. to high. Trace iron staining. Trace white nonCalcareous mineralization (maybe slightly weathered calcstone).
	12.0	1.4 (2)						12	-	* Sample only consists of a few fragments of material (probably same as above), Not enough to characterize.
	12.0	*						13	-	
Box 2 of 3	13.8							14	-	Claystone. Pinkish gray (5yr 8/1) to dark yellowish orange (10yr 6/6). Mod. to highly friable, mod. friable. Bedding not evident. Trace carb. material.
	15.3	1.7 (2)		6°		Clay > 80%		15	-	
	17.0	1.1				Clay > 80%		16	-	Same as above. Color change to very pale orange to pale yellowish brown (10yr 8/2 to 10/2). Some carb. material. Trace iron staining.
	17.4	.35				Clay > 80%		17	-	
	19.0	1.5 (2)				Clay > 80%		18	-	Same as above, some iron staining, trace carb. material.
	20.5 ↓	1.6 (2)				Clay > 80%		19	-	

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. 27-86

PAGE 3 OF 3

GEOLOGIST(S): UFA

DATE:

8/1/89

PROJECT NO: 557-102

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
	↑ 20.5									See previous page for description.
20.5 20.3	20.5 20.3	.49				Clay 250%		21		Silty Claystone. Very pale orange (10yr 8/2) to grayish orange (10yr 7/4). Highly weathered med. fr. abs. Bedding not evident.
22.0	22.0							22		Bottom of Boxes
								23		
								24		
								25		

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. 27-86

PAGE 1 OF 15

GEOLOGIST(S): *uff*

DATE: *7/20/80*

PROJECT NO: *100-100*

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		
								22		
								23		
								24		
25.05								25		Beginning of Boxes
25.05	25.05					Clay 77% Silt 23%		26	/ / / / /	Silty claystone. Very pale orange to dk. yellowish orange (10yr 8.2 to 6.6). Med. weathered, slightly friable. Some iron staining, some material in fractures. Bedding not evident. Clay at Trace CaCO ₃ .
28.5		2.9(1)						27	/ / / / /	
	28.5							28	/ / / / /	
31.5	31.5	0						29	X	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. 27-86

GEOLOGIST(S): LAA

DATE: 8/24/89

PROJECT NO:

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE 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 8.	31.5	0						31	X	
	33.5	1.7 ⁽¹⁾	SL			Clay >30%		32	---	Claystone. Grayish Orange to Lt. brownish Gray (10yr T4) to (5y 6/1), mod. weathered, mod. friable. Massive bedding. Some iron staining in fractures. Trace mica material.
								33	---	
	36.4	0						34	X	No Sample.
								35	X	
Box 2 of 8	38.5	1.55 ⁽¹⁾	SL			Clay >50% Silt ~30%		36	X	
	32.5							37	///	Silty Claystone. Very Lt. gray (N3) to Dk. yellowish orange (10yr 6/6) mod weathered, slightly to mod. friable. Bedding appears non-zonal but slightly disturbed. Trace carb material + iron staining.
								38	///	
	39.35							39	X	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. 27-86

PAGE 4 OF 15

GEOLOGIST(S): UAA

DATE: 8/24/89

PROJECT NO: 627-1141

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	49.3 ↑		SL	40°		Clay >70%		51	/ / / / /	Silty Claystone. Brownish gray (5y 4/1). Mod. weathered. Slightly to med. friable. Bedding appears massive. Some possible slickensides on fractures.
	51.0					Clay >70%		52	/ / / / /	Same as above. Trace carb. material.
	52.5	1.35 (1)						53	X	No Sample.
	54.0	0						54	X	
	55.7	1.7 (1)				Clay >50%		55	/ / / / /	Same as above.
Box 4 of 8	57.5	1.8 (1)				Clay >50%		56	/ / / / /	Same as above, some carb. material.
	58.3	0						57	/ / / / /	
								58	X	No Sample
	62.5 ↓	4.0 (1)				Clay >50%		59	/ / / / /	Same as above. Some Mod. yellowish brown (10y 5/4) discoloration in matrix and small siltstone pebbles (rounded) in matrix.

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. 27-86

PAGE 5 OF 15

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

PROJECT NO: 157-122

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
	58.3↑								/ / / / /	See previous page for description
	62.5							61	/ / / / /	
								62	/ / / / /	
* Box 4 of 8								63	/ / / / /	Silty Claystone (t. Olive gray (5y 6/1). Moderately weathered. Fract. to beddy friable. Bedding not evident. Some carb. material. Trace iron staining. Some unknown white mineralization in fractures.
		3.0 (2)		55°		Clay 75%		64	/ / / / /	
								65	/ / / / /	
	65.5									
								66	/ / / / /	Silty Claystone. Brownish gray (5y 4/1). Mod. weathered, slightly to mod. friable. Bedding appears horizontal. Some carb. material. Some grayish orange (10y 7/4) discoloration. Some very thin (threadlike) layers v.f.g. sand.
		2.0 (1)				Clay 75%		67	/ / / / /	
Box 5 of 8								68	/ / / / /	Same as above.
		1.6 (2)	SL			Clay 55%		69	/ / / / /	Same as above. More common v.f.g. sand layers
		1.7 (2)				Clay 75%				
	70.9↓									

Begin
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.



ROCKY FLATS PLANT

FIGURE NO.

* Had to erase to correct diagram.

LOG OF BORING NO. 27-86

PAGE 5 OF 15
64

GEOLOGIST(S): CAF
DATE: 5/24/89

PROJECT NO: 057 112

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	70.9							71	/ / / / /	See previous page for description
	72.5	(2) 1.9				Clay >50%		72	/ / / / /	Silty claystone. Brownish gray (5y 4/1). Med. weathered. med. friable. Bedding not evident. Trace carb. material. Some CaCO ₃ , some lt brown (5y 5/6) discoloration.
	73.2	0 (2) 1.8						73	X	No Sample
	75.0	1.8 ²				Clay >50%		74	/ / / / /	Same as above. No CaCO ₃ or discoloration.
	75.0							75	/ / / / /	
	77.5	(1) 2.9				Clay >50%		76	/ / / / /	Silty claystone. Lt. olive gray (5y 6/1). med. weathered. med. friable. Bedding appears horizontal, uneven. Some carb. material, trace iron staining.
	78.0	0						77	X	No Sample
	78.3	.4			≈10°	Silt >50%		78	- - - - -	Clayey siltstone. Yellowish gray (5y 3/1). Slightly weathered. Slightly friable. Slightly tilted uneven bedding. Some v.f.g. sand.
	80.2	1.85				Silt >50%		79	- - - - -	Same as above. Trace 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. 27-86

PAGE 6 OF 15
7/2

GEOLOGIST(S): UAA

DATE: 3/24/39

PROJECT NO: 117 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
	80.2									See previous page for description
Box 6 of 8		1.85			~20°	Silt >50%		81	|	Clayey Siltstone. Lt. olive gray (5y 4/1). Slightly weathered. Slightly friable. Distorted Bedding possibly due to soft soil. Deform. some v.f.g. sand. Some carb. material.
	82.0							82	|	Same as above
	82.5	.4				Silt >50%			|	
		.9				Clay >50%		83	|	Silty Claystone. Brownish gray (5y 4/1). Mod. weathered, mod. friable. Bedding not evident. Trace carb. material.
83.5	83.5									
Box 7 of 8		1.8 (1)				Clay >50%		84	|	Same as above. Highly weathered, highly friable.
	85.0							85	|	
		1.8 (1)				Clay >60%		86	|	Same as above. Mod. weathered, mod. friable
	86.8							87	|	Same as above.
	87.5	.6				Clay >60%			|	
		.6 (1)				Clay >70%		88	|	Same as above.
	88.3								|	
	1.6 (1)				Clay >70%		89	|	Claystone. Same as above, less silt.	
90.0										

Box 8 begins ↓

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. 27.86

PAGE 8 OF 15

GEOLOGIST(S): LAA

DATE: 8/24/87

PROJECT NO: 57422

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
915	90.0 91.5	1.7 ⁽¹⁾				Clay 710 ₀		91		Claystone. Brownish gray (5YR 4/1). med. weathered, mod. friable. Bedding appears massive. Trace carb. material, trace silt.
	92.5					Clay 710 ₀		92		Same as above. Possible slickensides.
	94.3							93 94		
	96.3					Clay 710 ₀		95 96		Same as above
						Clay 710 ₀		97		Same as above. Some carb. material
								98 99		

Box 8 of 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.

* This series appeared to end w/ box 8 of 8 but another series marked 27-86 was found - boxes 9-14.

LOG OF BORING NO. 27-86

GEOLOGIST(S): UAA

DATE: 8/24/89

PROJECT NO: 637-122

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
								91		
								92		
								93		
								94		
								95		
95.8	95.8	1.7 ⁽¹⁾				Clay ~5%		96	|||||	Silty claystone. Lt. olive gray. (Syloli). Slightly turned, weathered. Slightly friable. Bedding uneven horizontal. Some very thin (<1mm) layers silt + v.f.g. sand. Some carb. material.
	97.5							97	|||||	
		1.7 ⁽²⁾				Clay ~5%		98	|||||	Same as above.
Box 9	99.5							99	|||||	
	100.5								|||||	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.



LOG OF BORING NO. 27-86

PAGE 10 OF 15

GEOLOGIST(S): LAH
 DATE: 7/24/78

PROJECT NO: 100-22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION	
Box 9	99.5 ¹	1.8				Clay ~50%		101	/ / / / /	Silty claystone. Lt. olive gray to olive gray. (5y 6/1 to 4/1). Slightly weathered. Slightly friable. Bedding in thin layers. Uneven horizontal. Some silt in thin layers (41 mm) and v.f.g. sand. Trace carb. material.	
	102.5	.75				"		102	/ / / / /	Same as above.	
	103.7	0						103	X	No sample.	
	104.6	.75 ⁽²⁾				Clay ~50%		104	/ / / / /	Same as above	
	Box 10	106.5	.75				Clay ~50%		105	/ / / / /	Same as above.
		108.2	.75	SL		40°-50°			106	/ / / / /	
	107.5	1.0 ⁽²⁾						107	/ / / / /	Same as above.	
	109.0	1.7 ⁽²⁾						108	/ / / / /	Same as above. Bedding to tilt.	
	110.0							109	/ / / / /	Same as above. Bedding does not appear to be tilted. Some 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. 27-86

GEOLOGIST(S): VAP

DATE: 8/24/89

PROJECT NO: 27-1122

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
	100.0 110.5	.7(1)					Clay 75%		X	Silty claystone. Lt. olive gray to brownish gray. (Syl 6) to 4(1). Slightly weathered. Slightly friable. Disconformity. Bedding planes very thin (some less than 1 mm). Some very sand streaks.
		0						-111 -112 -113 -114	X	No Sample
	114.8						Clay 75%	-115	X	Same as above, grades to claystone toward bottom. Some slickensides in vertical fractures in clay stone.
Box 10		1.8(2)		90°			Clay 75%	-116	X	
	117.0							-117	X	No Sample
		0						-118	X	No Sample
	118.5							-119	X	Silty claystone. Lt. olive gray to olive gray (Syl 6) to 4(1). Slightly weathered, slightly friable. Bedding not evident. Trace carb. material.
Bot	119.5	1.8					Clay 75%		X	
Bot	120								X	

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
Next
Box ↓



ROCKY FLATS PLANT

FIGURE NO.

* Had to erase to correct diagram.

LOG OF BORING NO. 27-86

PAGE 12 OF 15

GEOLOGIST(S): LAN

DATE:

4/25/89

PROJECT NO: 147-122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
120.0	120.0						Clay		-----	Claystone. Olive gray (5y 4/1). Slightly weathered, slightly friable. Bedding appears massive. Trace carb. material. Some possible slicken-sides in fractures.
	*	1.6				>80%	←	-----		
	122.0						Clay		-----	Silty Claystone. Lt. Olive gray (5y 6/1). Slightly weathered, slightly friable. Massive bedding. Trace carb. material.
		(2) 1.7	2			75%	←	-----		
	124.0						Clay		-----	Same as above, less silty
		(2) 1.75				70%	←	-----		
	126.0						Clay		-----	Same as above, more silty
		(2) 1.25				75%	←	-----		
	127.0						Clay		-----	Same as above.
	127.4	.35				75%	←	-----		
		(2) 1.65					Clay		-----	Sandy Claystone. Brownish gray (5y 4/1). Slightly weathered, slightly friable. Massive bedding. Some carb. material. Sand v. fq. well sorted.
						75%	←	-----		
129.5	129.5						Clay		-----	Same as above. Very thin coal leaflets 1mm.
	130.0	.3				75%	←	-----		

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.

* Had to erase to correct diagram

LOG OF BORING NO. 27-86

PAGE 13 OF 15

GEOLOGIST(S): UFA

DATE: 7/24/87

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
130.5	130.0					Silt >50%			---	Clayey Siltstone. Pinkish gray to Lt. Olive gray (5y 7/1 to 5y 6/1). Slightly weathered, slightly friable. Bedding disturbed, probably from SS+ sed. deformation. Some carb. material at top. Some v.f.g. sand, especially at top. Traces fine yellowish orange clay silt.
	131.2						131	---		
	132.0				40°	Silt >50% Sand ~30%		132	---	Sandy Siltstone. Pinkish gray (5y 7/1). Max. weathered, not friable. Tilted, layered bedding in thick layers. Sand v.f.g. Some clay.
	133.5	0						133	X	No Sample
	134.3					Silt >50% Sand ~30%		134	---	Same as above, grading to silty claystone.
	136.2					Clay >50%		135	/ / / / /	Silty Claystone. Olive gray (5y 4/1). Slightly weathered, slightly friable. Bedding not evident. Some small bodies of silt (2 in. dia.).
	137.0					Clay >50% Silt ~15% Sand ~25%		136	/ / / / /	Same as above with some siltier layers
	138.8	0						137	X	No Sample
	139.8					Clay >50%		138	/ / / / /	Silty Claystone as above.

Box 12

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. 27-86

PAGE 14 OF 15

GEOLOGIST(S): CAF

DATE: 3/25/87

PROJECT NO: 657-1127

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
	137.0	(1) 1.7					Clay 75%	141	/ / / / /	Silty claystone, lt. olive gray (5y 10/1). Slightly weathered, slightly friable, massive bedding.
141.5	141.5									
	142.0	.45	5L				Clay 75%	142	/ / / / /	Same as above.
		(1) 1.3					Clay 75%	143	/ / / / /	Same as above. Unconform bedding, some carb. material.
	143.5									
		1.55					Clay 55%	144	/ / / / /	Same as above, some silt layers, very thin (<1mm.) Trace spotty iron staining.
	145.2							145	/ / / / /	
		(2) 1.85			~25°		Clay 75%	146	/ / / / /	Same as above, interbedded in very fine layers w/lt. f.g. sandstone. (layers <1 mm.) Trace carb. material.
	147.0							147	/ / / / /	
		(2) 1.9					Clay 75%	148	/ / / / /	Same as above. Some grayish orange (10y 7/4) discolored silt in some areas.
	149.0							149	/ / / / /	
		(2) 1.8					Clay 75%		/ / / / /	Same as above.
	150.8									

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. 27-86

PAGE 15 OF 15

GEOLOGIST(S): 164
 DATE: 7/25/32

PROJECT NO: 017-1122

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
150.8	↑					Clay			/ / / / /	See previous page for description of this interval.
		(2) 1.2				Clay		151	/ / / / /	Silty Claystone. Brownish gray to pinkish gray (5gr 6/1 to 8/1). Slightly weathered, slightly friable. Bedding in thin layers predominantly horizontal. Some silt in thin layers. Some (thin) clay silt discoloration. Some carb. mat.
								152	X		No sample
		0						153	X	
								153.8		
								154.3	/ / / / /	Same as above.
								155	. . . . .	Same as above. Also has med. brown to very dark red coloring. Probably due to a high iron content. Down to have well defined silt layers as above. Bedding is distorted. Had been layered but has been distorted probably from
		(1) 1.85	SL			Silt		156	
								156.3		
		(5)				Clay		157.0	/ / / / /	Silty Claystone. Lt. brownish gray (5gr 6/1). Slightly weathered, slightly non- friable. Massed bedding. Trace carb.
								157		Bottom of Boxes
								158		Sandstone. Brownish gray (5gr 4/1 to mod. yellowish brown to very dark red (10gr 5/4 to 10R 22). Slightly weathered, slightly to non-friable. Bedding had been layered but is distorted probably from tectonic activity or slumping. Contains healed fractures. Trace carb. Some silt. sand v.f.g.
								159		

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. 28-86

GEOLOGIST(S): JCS
 DATE: 2/24/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE OF 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	(1)				~50% clay ~50% sand	CL	1	0.0-1.0	Gravelly Clay, moderate brown (5 YR 3/2) low to moderate plasticity, some silt and sand, abundant caliche precipitates dispersed throughout clay
	1.0	0						2	X	No Sample
	2.0	(1)				>50% Gravel	GC	3	2.0-3.0	Clayey Gravel, light gray (N7) matrix is moderate brown (5 YR 3/4), angular to subangular, poorly graded, max. size 5.5 cm, some sand and silt.
	3.0	ND						4	3.0-4.0	Below 3.0 ft. interval containing abundant caliche, disseminated in clay matrix and as a rim on the gravel
	4.0	ND						5	4.0-4.4	
	4.4	(1)						6	4.4-5.0	
	5.0	1.3						7	5.0-6.5	
	6.5	0						8	X	No Sample
	8.0					>50% clay	CP	9	8.0-9.3	Two small subrounded max size 2.5 cm cobbles, medium gray (N5), claystone, light gray (N5), bedding not apparent, highly weathered, slightly friable, local iron staining, body of caliche at ~8.8 ft.
	9.3	ND						11.0	9.3-11.0	Color varies to yellowish gray (5 Y 7/2)

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.



LOG OF BORING NO. 28-86

PAGE 2 OF 2

GEOLOGIST(S): DCB
 DATE: 8/24/79

PROJECT NO: 667-1175

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
11.0 ↑ 10.5 ↓ 10.0	9.5 to 11.0	ND				250' clay		11	---	A = Above Bottom of Box 2 of 2 at 15.5 ft.
	11.0 to 12.5	ND						12	---	
	12.5 to 14.0	(1) 1.5						13	---	
	14.0 to 14.8	ND						14	---	
	14.8 to 15.5	ND						15	---	
								16	---	

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.



ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 29-82		PAGE 1 OF 3		GEOLOGIST(S): DCB		DATE: 8/16/87		PROJECT NO: 552-1122		
TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0	0.0	(1)			CLAY	GC	1	0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00	Gravel, dominantly very light gray (No. 28), subangular well sorted, max. size 5.5 cm. Dracled clay-gravelly brown (5-1/2), some platy debris and silt.
2.0	2.0	2.0	ND			CLAY	GC	2	1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00	Clayey gravel, light gray N7, clay matrix is brown (5R 3/2), angular poorly graded, max. size 0.6 cm.
2.5	2.5	2.5	ND			CLAY	GC	3	2.00 2.10 2.20 2.30 2.40 2.50	Generally clay, moderate brown (5YR 4/4) in plasticity, some silt and vgs.
3.6	3.6	3.6						4		No Sample
4.0	4.0	4.0						5		
7.5	7.5	7.5	ND			CLAY	GC	7	6.00 6.10 6.20 6.30 6.40 6.50 6.60 6.70 6.80 6.90 7.00	Silt, generally clay, moderate yellowish brown (10 YR 5/4) moderate to high plasticity, some gravel.
7.5	7.5	7.5	(1)			CLAY	GC	8	7.00 7.10 7.20 7.30 7.40 7.50	Clay, moderate yellowish brown (10 YR 5/4) moderate to high plasticity, some silt and gravel.
9.5	9.5	9.5						9	8.00 8.10 8.20 8.30 8.40 8.50 8.60 8.70 8.80 8.90 9.00	Clay, generally moderate to high plasticity, some silt and gravel, some silt and gravel, some silt and gravel, some silt and gravel.
11.0	11.0	11.0	ND						9.00 9.10 9.20 9.30 9.40 9.50	Silt and gravel, some silt and gravel, some silt and gravel, some silt and gravel.

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

304 1022

LOG OF BORING NO. 29-86

PAGE 2 OF 3

GEOLOGIST(S): DCE

DATE: 3/13/89

PROJECT NO: 057-1102

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 2 10.0 ↑ 11.0	9.5 to 11.0	ND				>50% clay	CL		[Lithologic Log Symbol]	As above
↓ 11.0	11.0 to 12.5	ND						11	[Lithologic Log Symbol]	
	12.5 to 12.5	ND				>50% silt		12	[Lithologic Log Symbol]	
Box 2 of 2	12.5 to 14.5	ND						13	[Lithologic Log Symbol]	Sandy siltstone, dark yellowish orange (10 YR 6/6), to very light gray (N8), bedding not apparent, moderately friable, irregular body of calcite at ~14.3 ft, sand is v. f.
	14.5 to 14.5	ND						14	[Lithologic Log Symbol]	
	14.5 to 16.0	ND						15	[Lithologic Log Symbol]	
	16.0 to 16.0	ND						16	[Lithologic Log Symbol]	
	16.0 to 17.5	ND						17	[Lithologic Log Symbol]	
	17.5 to 17.5	(1)						18	[Lithologic Log Symbol]	
	17.5 to 22.5	1.5						19	[Lithologic Log Symbol]	

NOTES: General USCS is modified for this log as follows:
 Material amounts are estimated by % volume instead of % weight.
 (1) Body 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. 29-86

PAGE 3 OF 3

GEOLOGIST(S): DCD
 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
Box 2 of 2 ↑ 22.5	17.5 to 22.5	(1) 1.5						-21 -22 -23		As above weathered Fe oxide concretions at 22.5 ft. Bottom of Box 2 of 2 at 22.5 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. 30-86

PAGE / OF

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
0.0	0.0	(1)				250% Clay	CL			Clay, light brownish gray (5 NR 4/1), grades to light very light gray (NS), weathered to low plasticity , calcareous, some roots and gravel in upper 1.5 ft., some silt in upper 2.0 ft.
↓	to 1.5							1		
	2.0							2		Internal grades to highly weathered or incompletely indurated claystone.
	2.0	DCB								
	to 1.7							3		Claystone, very light gray (NS), bedding not apparent, highly weathered, slightly friable occasional iron stains and bodies of caliche
	4.0							4		
	4.0							5		Slight amount of mg oxide mineralization below 8.0 ft and iron stains occur on fractures, rock is more competent.
	to ND	ND						6		
	6.0							7		
	6.0									
	to ND	ND						8		
	8.0									
	8.0							9		
	to ND	ND								
↑	10.0									

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.

ICB

LOG OF BORING NO. 30-86

GEOLOGIST(S): DCB

DATE: 8/27/89

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
10.0	10.0									<p>Claystone, very light gray (MS), bedded but apparently tough, weathered, slightly friable, iron staining locally and on partings, no oxide mineralization occurs locally, slight silt fraction.</p>
↓	to	ND						11		
	11.0									
	to	ND						12		
	12.0									
	to	(2)						13		
	14.0									
	to	1.5						14		
	14.0									
	to	ND						15		
	16.0									
↑	16.0							16		Bottom of Box 2 of 2 at 16.0 ft.
								17		

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. 30-26

PAGE 1 OF 3

GEOLOGIST(S): *Las*
 DATE: 8/23/89

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 ↓	0.0 -2.0							1	|	TOP 3 IN: Saway Clay, yellowish gray (54%) mod. plast, some gravel (max size = 30%) Some waste of quartz, calcareous
	2.0 -3.5							2	|	CLAYSTONE, light olive gray (54%), non-apparent bedding, highly weathered, med-low friability, trace of carb material, trace of gravel to rubble imp material , trace of silt
	3.5 -5.2							3	|	Same as above: non staining as matter, no gravel, some silt
	5.2 -6.5							4	|	Same as above: NON-CALCAREOUS, calcite
	6.5 -8.2							5	|	Same as above: trace of calcite, trace of gravel
	8.2 -10.4							6	|	Same as above: no apparent gravel
								7	|	
								8	|	Same as above: trace of silt, med friable, no apparent carb material
								9	|	

Box 1 of 3

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. 30-36

PAGE 3 OF 3

GEOLOGIST(S): *Day*
 DATE: *8/23/89*

PROJECT NO: *177-1122*

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
<i>801303 ↑ 715</i>	<i>20-20.5</i>							21		<i>CLAYSTONE, light olive gray (5 Y 6/1), non-apparent bedding, highly weathered, mod friable, some micro fractures, some non-staining along fracture planes, ^{FMA} some calc. material</i>
<i>END OF BOXES</i>								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. 31-86

PAGE 1 OF 3

GEOLOGIST(S): DCR
 DATE: 8/24/87

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
0.0	0.0					75% clay	CL			Silty Clay, pale yellowish brown (10 YR 6/2), low to med calc plasticity, trace of roots and gravel
	to	ND				75% silty fine		1		
	2.0							2		Sandstone, very light gray (N8) to grayish orange (10 YR 7/4), bedding not apparent to apparent soft sediment deformation, highly weathered, moderately friable, very fine grained, well sorted, calcareous fracture fillings.
	2.0							3		
	to	1.1						4		
	4.0							5		
	4.0	ND						6		
	4.4							7		
	to	ND						8		
	6.4							9		
	6.4							10		
	to	.55		35°				11		
	7.0							12		
	7.3							13		
	to	ND						14		
	8.0							15		
	8.0							16		
	to	ND						17		
10.0	10.0									

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. 31-86

PAGE 2 OF 3

GEOLOGIST(S): DCE

DATE: 8/24/87

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
10.0 ↓	10.0 to 12.0	ND				>85% silt <15% fines		11		Sandstone as above, calcareous fracture fillings are absent.
	12.0 to 13.0	0						12	X	No Sample
	13.0 to 14.5	ND	DCE-29		25°	>85% silt <15% fines		13		Sandstone as above (reference interval 0.44 to 12.0 ft), bedding apparent at ~14.3 ft, slight dip, structures not discernible, abundant iron staining.
	14.5 to 16.3	ND				>50% silt		14		
	16.3 to 17.0	ND				>50% clay		15		Interval grades to siltstone.
	17.0 to 17.7	ND		90°		>80% silt <20% fines		16		Siltstone, grayish orange (10 YR 7/4), bedding not apparent, highly weathered, moderately friable, slight v. g. sand component.
	17.7 to 19.5	ND				>80% silt <20% fines		17		Interval grades to silty claystone at ~16.2 ft.
	19.5 to 21.0	ND				>80% silt <20% fines		18		Silty claystone, light gray (N7), bedding not apparent, well weathered, slightly friable, iron staining, locally bed on fractures.
	21.0 to 21.5	ND				>80% silt <20% fines		19		Interval becomes silty sandstone at ~17.0 ft.
	21.5 to 21.8	ND				>80% silt <20% fines		20		Silty sandstone, dark yellowish orange (10 YR 6/6), bedding not apparent, highly weathered, moderately friable, abundant iron stains.
	21.8 to 22.0	ND				>80% silt <20% fines		21		Siltstone, very light gray (N8), bedding not apparent.

Box 2nd 3rd

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. 31-86

PAGE 3 OF 3

GEOLOGIST(S): DCB
 DATE: 8/24/89

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
										(cont'd from previous page)
<u>Box 3</u>	<u>19.5</u> <u>to</u>	<u>40</u>				<u>5-50% 7</u>			---	not apparent, well weathered, slightly friable, slight vfg sand component, possible iron oxide mineralization, local iron staining, abundant iron staining below 19.5 ft., slight clay fraction
<u>Box 1</u>	<u>21.0</u> <u>21.0</u> <u>to</u>						-21-	---		
<u>22.0</u>	<u>22.0</u>	<u>ND</u>					-22-	---		
								-23-		Bottom of B or 2 of B at 22.0 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. 32-86

PAGE 2 OF 3

GEOLOGIST(S): LAA

DATE: 8/21/89

PROJECT NO: 1567-1122

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	10.5								-	Cont. from previous page) Carb. material in fractures. Some v.f.g. sand.	
		1.5(1)			20°	Silt 75%		11	-	Clayey siltstone. Very lt. gray to dk. yellowish orange (N8) to (10yr 6/6). Mod. weathered, mod. friable, layered tilted bedding. Some carb. material in fractures. Some CaCO ₃ some iron staining. Some v.f.g. sand.	
		12.0						12	-		
		1.75(1)					Silt 75%		13	-	Same as above. Bedding closer to horizontal.
		13.8						14	-		
		1.7(1)					Silt 75%	15	-	Same as above. Slightly weathered, slightly friable. Bedding not evident.	
Box 3 of 4		1.7(1)				Silt 75%		16	-	Same as above.	
		17.0						17	-		
		1.7(2)				Clay 75%		18	-	Silty claystone. yellowish gray (5yr 8/1) to dk. yellowish orange (10yr 6/6) mod. weathered, slightly friable. Bedding not evident. Some iron staining in fractures. Trace carb. material and CaCO ₃ .	
		18.8						19	-	Same as above. Some pure silt areas. Some very heavily iron stained areas.	
	1.6(2)					Clay 75%		20.0	-		

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. 32-86

PAGE 3 OF 3

GEOLOGIST(S): *LA*

DATE: *8/21/77*

PROJECT NO: *57-1122*

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 4	20.0	1.8 (1)				Clay 50%		21	/ / / / /	Silty Claystone. Lt. Olive gray (5y 6/1) to dk. yellowish orange (10Yr 6/6). Mod. weathered. Slightly friable. Some iron staining + Carb. material. Some CaCO ₃ in areas. Some small areas of pure silt. Not in layers.
	22.0	1.8 (1)				Clay 75%		23	/ / / / /	Same as above
	23.9	1.7 (1)				Clay 75%		24	/ / / / /	Same as above
	25.5	1.6 (1)				Clay 75%		26	/ / / / /	Same as above.
Box 4 of 4	27.0						27			Bottom of Boxes
							28			
							29			

Box 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. 32-86

PAGE 1 OF 11

GEOLOGIST(S): DCB
 DATE: 8/24/89

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
X		X							X	No Core above 31 ft.
31.0 ↓	31.0 to					75% clay		31		Claystone light gray (N7), bedding not apparent weathered slightly friable, iron staining on fractures, occasional carbonaceous mineralization.
	32.2 to	ND						32		
	33.2 to							33		
	34.0 to	(1) 1.0						34		
	36.0 to							35		
36.0	36.0							36		No Sample
								37		
	to	0						38		
	45.0							39		

10 ft
 15 ft
 10 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. 32-86

GEOLOGIST(S): DCB
 DATE: 8/24/89

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
	36.0							41		<p style="font-size: 2em;">No Sample</p>
	to 0						42			
							43			
							44			
							45			
	45.0					> 50% Clay		45	<p style="font-size: 0.8em;">Claystone, light gray (N7), bedding not apparent, weathered slightly friable, iron staining and fractures.</p>	
	45.0 to 45.5	ND						46		
	45.5 to 1.0	(1)						47		
	47.0							47		<p style="font-size: 2em;">No Sample</p>
	47.0 to 0							48		
	48.3					> 50% Clay		48		
	48.3 to 49.0	ND		90°				49		
	49.0 to 51.0	ND						49		

1027
 301

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. 32-876

PAGE 3 OF 11

GEOLOGIST(S): DCB
 DATE: 2/24/89

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 up ↓	49.0 to 51.0	ND				750% clay			---	Claystone, as above (reference interval 45 to 47 ft.)	
	51.0 to 52.0			90°				---			
	52.0 to 53.0							---			
	53.0							---			
Box 2 up ↓	53.0 to 54.7	ND		80°		750% clay			---	Claystone as above (reference interval 45 to 47 ft.) bedding not apparent to thin (2mm) with slight dip, slight silt fraction occurs as individual streaks w/in interval	
	54.7 to 56.5			80°				---			
	56.5 to 57.0	(2) 0.3			10°			---			
	57.0 to 57.7							---			
	57.7 to 59.2	0						---	X		No Sample
	59.2 to 61.0							---			
	57.7 to 59.2	ND			-5°	750% clay			---		Claystone, medium gray (NG), bedding not apparent to thin (2mm) slight dip, weathered, slightly friable, slight silt fraction, iron staining occurs locally.
	59.2 to 61.0							---			

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. 32-87

PAGE 4 OF 11

GEOLOGIST(S): DCB
DATE: 8/24/87

PROJECT NO: 66-11-22

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 up ↑	59.2				250° Clay					Claystone as above slickensides at 60.6 ft. curvilinear surface.	
	to	ND									
	61.0										
	61.0										
Box 3 up ↑	to	ND								x Claystone (as above) Bedding not apparent and amount iron staining diminishes below 62.8 ft. silt fraction is disseminated throughout.	
	62.0										
	62.0										
	62.8										
Box 3 down ↓	62.8										
	to	ND									
	65.0										
	65.0										
Box 3 down ↓	to	ND									
	67.0										
	67.0										
	to	0								No Sample	
Box 3 down ↓	71.5										

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. 32-86

GEOLOGIST(S): DCB
 DATE: 8/24/39

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
	67.0 + 71.5	0						71	X	No Sample
	71.5 + 72.0	ND						72	---	Claystone, dark gray (N3), bedding may be horizontal based on appearance of core breaks, weathered, slightly friable, carbonaceous, occasional bodies of coal.
	72.0 + 74.5	(1) .3					73	---		
	74.5 + 75.5	(1) .7						74	---	Claystone, medium gray (N5), bedding not apparent, weathered slightly friable, moderate amount of carb. mineralization, slight siltification.
	75.5 + 77.0	ND					75	---		
	77.0 + 77.0							76	---	sl. lenses at ~76.8 ft 55° to ~90°
	77.0 + 80.0						77	---		
								78	X	No Sample
								79	X	

Not 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.



LOG OF BORING NO. 32-876

GEOLOGIST(S): D. C. B.
 DATE: 8/24/59

PROJECT NO: 667-11.7

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
Not 30ft ↑ 82.6	80.0 to 80.4	2 ⁽¹⁾				75% Clay		81	[Lithologic Log Symbols]	Claystone as above (reference interval 72.0 to 77 ft.) slickensides at ~83.0 ft., curvilinear surface.
	82.0 to 82.0	ND						82		
↓ 82.0	82.0 to 83.0	ND						83	[Lithologic Log Symbols]	No Sample
	83.0 to 84.0	0						84		
	84.0 to 84.7	(1) .55				75% Clay		85	[Lithologic Log Symbols]	Claystone as above (reference interval 72.0 to 77.0 ft.)
	84.7 to 87.0	ND						86		
	87.0 to 88.2	0						87	[Lithologic Log Symbols]	No Sample
	88.2 to 90.3	ND				75% Clay		89	[Lithologic Log Symbols]	Silty Claystone, light gray (N7) thin (2cm) horizontal bedding, slightly friable, moderate amount of carb. 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.



LOG OF BORING NO. 32-82

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	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 4 of 7	89.2 to 90.3	ND				>50% Clay				silty claystone as above bedding exhibits soft sediment deformation, and silt fraction increases.
	90.3 to 92.0	ND						91		
	92.0 to 92.0	0						92		
	92.0 to 93.8	0						93		
	93.8 to 93.8	0						94		
	93.8 to 95.5	ND			~5°	~50% clay ~50% silt		95		
	95.5 to 95.5	ND						96		
	95.5 to 97.0	0						97		
	97.0 to 97.0	0						98		
	97.0 to 99.4	0						99		
Box 5 of 7	99.4 to 99.7	.250			~5°	>50% Clay				Claystone medium light gray (N6), thin bedded (<2mm), slight dip.
	99.7 to 101.5	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.



LOG OF BORING NO. 32-84

PAGE 8 OF 11

GEOLOGIST(S): DCB
DATE: 8/25/86

PROJECT NO: 61.7-11.72

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
	99.7 to 101.5	ND				V 50% clay		101	---	(cont'd. from previous page), slightly friable, fine-bedded siltstone occurs throughout interval, carb. mineralization occurs on partings.
	101.5 to 103.0	ND						102	---	
	103.0 to 104.7	0						103	---	
	104.7 to 105.0	ND						104	X	No Sample
Box 5 of 7	105.0 to 107.0	ND						105	---	Claystone as above (reference interval 99.7 to 101.5 ft).
	107.0 to 109.7	0						106	---	
Box	109.7 to 112.0	ND						107	---	
								108	---	
								109	---	
								110	---	
								111	---	
								112	---	

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. 32-876

PAGE 9 OF 11

GEOLOGIST(S): DCB

DATE: 2/25/89

PROJECT NO: 467-1122

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 7	109.7 to 112.0					>50% clay		111	---	(cont'd. from previous page), not apparent, slightly friable, moderate silt compaction. Slickensides occur at ~111.0 ft, attitude of ~28°.
	112.0 to 112.0		0					112	X	No Sample
↓	112.85 to 112.85					>50% clay		113	---	Claystone as above (reference interval 109.7 to 112.0),
Box 6 of 7	113.0 to 115.2	N/D						114	---	Slickensides at ~113.3 ft., badly broken, attitude cannot be accurately measured.
	115.0 to 115.2	N/D						115	---	Interval grades to a carbonaceous clay at ~114.8 and the color changes to dark gray (N3).
	117.0 to 117.0		N/D			~85% vfg ~15% silt		116	X	Interval grades to sandstone, bioturbated, slightly friable, vfg, well sorted, slight to moderate silt fraction.
	119.8 to 119.8		0					117	---	
	119.8 to 119.8		0					118	X	No Sample
	119.8 to 119.8		N/D					119	---	sandstone as above (reference 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. 32-86

PAGE 10 OF 11

GEOLOGIST(S): DCB
 DATE: 8/25/86

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
	119.8 to 121.1	ND				vs vfa -80% silt		121	X	(cont'd from previous page) 115.2% 117.0. Influx of silt below 121 ft. bedding is thin (<2mm) and exhibit soft sediment deformation.
	121.1 to 122.0	DCB						122	X	No Sample
	122.0 to 122.8	0						123	X	No Sample
	122.8 to 124.7	(2) .8				vs silt -80% Fines -20%		124		Silt. Sandstone, very light gray (N8) to med. dark gray (N4), thin bedded (<2mm) interbedded clay silt and sand exhibit soft sed. deformation, desiccation structures, slumps, slightly friable, occasional iron staining.
	124.7 to 126.3	ND						125		Friable, vs sand, vertical burrows occasional iron staining.
	126.3 to 127.0	1.7			20°	-40% silt -30% clay		126		Silt. Claystone medium gray (N5) bedded, not apparent slightly friable, occasional iron staining, carb mineralization on particles.
	127.0 to 128.0					vs 10% vfa silt		127		Interbedded siltstone and claystone and vs sandstone, light gray (N7) to med. light gray (N6) bedded is typically <2mm, moderate dip, slightly friable, local iron staining.
	128.0 to 130.0	0						128	X	No Sample
								129	X	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. 32-86

PAGE 11 OF 11

GEOLOGIST(S): DCB
DATE: 8/25/81

PROJECT NO: 47-1152

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 7	130.0					750 ⁺ Clay			---	Claystone, med. dark gray (N4) bedding not apparent, slightly friable, moderate silt fraction, carb. mineralization on partings, occasional iron stains, silt fraction increases with depth.
	to	ND						131	---	
	132.0							132	X	No Sample
	to	0						133	X	
↑	133.5					50 ⁺ Clay			---	Claystone as above (reference interval 130.0 to 132.0)
	to	ND						134	---	
	135.0							135	---	Bottom of Box 7 of 7 at 135.0 ft.
	to							136	---	

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. 33-86

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

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	ND				>50% Gravel 2-50% clay	GC	0.0	0.0	Clayey Gravel, dominantly light gray (N7), clay matrix is light brownish gray (5 YR 6/1), subangular to subrounded, poorly graded, some roots, matrix is calcareous.
1.7	1.7										1	0.0	1.7
	4.8	(2)				>50% clay	CL	2	0.0	Gravelly Clay, pale yellowish brown (10 YR 6/2), low to moderate plasticity, some silt, calcareous
	1.3							3	1.7	color grades to dusky brown (5 YR 2 1/2), from 4.6 ft to 6.0 ft.
	4.8	(2)				>50% Gravel	GC	5	0.0	Clayey Gravel, dominantly light gray (N7), clay matrix is pale brown (5 YR 5/2), subangular, poorly graded, max. size = 2.5 mm.
	1.4							6	4.8	
	6.8	ND				>50% clay	CL	7	6.8	Clay, moderate yellowish brown (10 YR 5/4), moderately low plasticity, trace of silt.
	8.4								8	
	10.1	ND				>50% clay		9		Interval grades to claystone. Claystone with (red) yellowish brown (10 YR 5/4) to light gray (N7) bedding not apparent, highly weathered.

Bot 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. 33-86

PAGE 2 OF 2

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

PROJECT NO: 117-11-32

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
10.1	10.1									(cont'd. from page 1), slightly irrad. local iron staining.
↓	+	ND						11		
	11.8									
	11.8							12		crystalline as above with abundant iron staining from ~ 11.8 ft to 13.6 ft.
	+	ND						13		
	13.7									
	13.7							14		
	+	ND						15		slickerside at ~ 14.8 ft., strike +5°
	15.5									
	15.5							16		some carbonaceous mineralization at ~ 16.6 ft.
	+	ND						17		Bottom of Box 2 of 2 at 16.8 ft.
	16.8							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.

(LIST SAYS 11 BOXES TOTAL)

-upland boxes, added to end of log

LOG OF BORING NO. 34-86

PAGE 1 OF 4

GEOLOGIST(S): *ADJ*
 DATE: 8/21/64

-for this boring, there were 2 sets of boxes
 1) Box 1/4, 2/4, 3/4, 4/4 - d 2) 5/11,
 6-11/11. Set 1 was drilled 8/20/66 to 37.3'
 and Set 2 was 3/26/66 + 5/11/66 - d 33'

PROJECT NO: 67-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0 ↓	0.0-1.3	ND					CL	1	---	CLAY, light grey (N7), mod. plast., some roots, trace of gravel (5.5 cm), trace of sand
	1.3-2.0	φ						2	X	NO SAMPLE
	2.0-2.3	ND					CL	2	---	Same as above, moderate yellowish brown (10 YR 5/4), some salt, trace of twigs, some iron staining at base
	2.3-4.0	(1) 1.5					CL	3	---	Same as above; no roots or twigs, some calcareous material, esp in bottom of interval
	4.0-7.0	φ						4 5 6	X	NO SAMPLE
	7.0-9.4	(2) 1.7					CL	7 8 9	---	Same as above
	9.4-12.0	φ							X	NO SAMPLE

Box 1 of 11

I assumed this to be the same 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. 34-86

PAGE 3 OF ~~4~~
10

GEOLOGIST(S): *DAJ*
DATE: *8/21/82*

PROJECT NO: *34-11.27*

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 A11	22.5 -24.5	ND		70° 110°				23		CLAYSTONE, yellowish grey (5 YR 8/1) massive bedded, well weathered, mod. friability, iron staining as much as trace of Mg staining, fractures at 70° and 110°
	24.5 -24.5	ND						25		See as above
	26.5 -27.8	ND						27		See as above
	27.8 -29.8	(1) 1.8		60°				28 29		See as above: light brownish grey (5 YR 4/1), some carb material, esp at bottom of interval, fracture @ 60°
29.8-31.0	1.7(1)		90°, 70°						See as above: fractures at 90° & 70°	

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. 34-86

GEOLOGIST(S): *DCW*
DATE: 8/21/87

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
								31		See previous page
	31.8 - 32.8	(1) 1.2		90° -70°				32		CLAYSTONE, light grey (NF), massively bedded, highly weathered, most friable, some iron staining as mottled and along fracture planes, some silt, some carb material, fractured at 40°-70° base of calc. material
	32.8 - 33.4	ND		20°				33		
	33.4 - 35.4	(2) 1.8		70° -90°				34		Same as above: yellowish grey (5 Y 3/1) 20° fracture, no calc.
	35.4 - 35.4							35		Same as above
	35.4 - 36.8	(1) 1.7		70° -90°				36		See as above: fractures @ 20°, 40°, 85°, 60°
	36.8 - 37.8	ND		20°, 40° 85°, 60°				37		
	38.0 - 42.3	(2) 4.3						38		DISCREPANCY BETWEEN BOXES See as above: light olive grey (5 Y 6/1) at top of interval to olive black (5 Y 2/1) at bottom of interval, trace of iron stain along
		ND						39		

Core log

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.



ROCKY FLATS PLANT

FIGURE 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
89.0	89.0 - 92.0	ND			20°	80% SAND		89		<p>SILT VFG-FG SANDSTONE, very slight gray (NS), bedding - thin slab - strong exposure (2 1/2 in - 1/2 in long)</p> <p>Some cross-stratification, general bedding angle of 20°, some weathered, mud-poorly friability, sub-angular, sub rounded, well sorted, trace of carb. matter. Some clay.</p>
88.0	88.0 - 89.2	(2)	18			40% SILT		85		<p>See as above: yellowish gray (5 Y 8/1)</p>
87.0	87.0 - 88.0	(2)	12			35% SILT		87		<p>See as above: olive gray (5 Y 4/1), weathered silt fracture, conchoidal texture, some VFG sand</p>
86.0	86.0 - 87.0	(1)	0.2			25% SILT		86		<p>See as above: yellow texture, we now staining, mica-fracture more apparent</p>
84.0	84.0 - 85.0	(2)	3.2			75% SILT		84		<p>SILT claystone, olive black (5 Y 2/1), we appear bedded, well weathered and friability, sand carb. matter. Some non staining so weathered, mica fractured</p>

Box 9 of 11

LOG OF BORING NO. 34-84

PAGE 9 OF 10

PROJECT NO: 667-1122

DATE: 8/22/82

GEOLOGIST(S): LLS

LOG OF BORING NO. 34-86

PAGE 10 OF 16
9 40

GEOLOGIST(S): *MG*
DATE: 8/22/89

PROJECT NO: 6077-11.22

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										
Box 10 of 11	92.0 - 96.0					60% SAND 40% SILT		92		SILTY VFG-FG SANDSTONE, very light gray (NG), bedding is non-apparent (coating on core), well-mod weathered, mod-poorly friable. Subangular-subrounded, mod-well sorted, some carb. material. Some clay.
		ND						93		
								94		
								95		
Box 11 of 11	96.3 - 96.3	ND						96		SILTY CLAYSTONE, dark greenish gray (SGY 4/1), non-apparent bedding, highly weathered, mod. friable, some carb. material, trace non-stony as matrix to modulus. Same as above.
	96.3 - 100.0	(1)						97		
		3.7						98		
								99		

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 BOXES



ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 35-86

PAGE 2 OF 2

GEOLOGIST(S): UAA

DATE: 8/14/89

PROJECT NO: 47-1122

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								//	See previous pg. for description.
Box 2 of 3		1.9(1)	UAA #4			Silt 75% Clay 24%		11	---	Clayey silt. Very lt. gray (N8) to dk. yellowish orange (10YR 6/6). Bedding not evident. Highly weathered. Mod. to slight. friable. CaCO ₃ mineralization in some small discontinuous fractures. Trace root material.
								12	---	
		12.5							---	Same as above Grading to claystone. Dk. yellowish orange (10YR 6/6). Highly weathered. Slightly to mod. friable. CaCO ₃ in fractures. Some in matrix. Bedding not evident. Some iron staining. Trace silt.
		14.0	1.6(1)				Clay 75%		14	
		1.85(1)				Clay 78%		15	---	Claystone. Very pale orange (10YR 8/2) to dk. yellowish orange (10YR 6/6). Highly weathered. Slightly friable. CaCO ₃ in fractures & some in matrix. Iron ox. matrix (± 2.5 cm) present. Some iron staining. Trace carb. material.
Box 3 of 3	16.0		*			Clay 75%		16	---	Claystone. Lt. olive gray. (5Y 6/1). Mod. weathered. Bedding not evident. Slightly friable. Some iron staining in fractures. Trace CaCO ₃ trace carb. material.
	18.0							17	---	
								18	---	Bottom of Boxes
								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.

* Core was in black plastic bag. Impossible to measure.

LOG OF BORING NO. 36-86

PAGE 1 OF 2

GEOLOGIST(S): *lay*

DATE: 8/22/87

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
0.0 ↓	0.0 - 0.3	N/A				30% SAND 70% CLAY	CL			SANDY CLAY, pale yellowish brown (10 V12 6/2), mod-high plast. some roots, trace of gravel, slightly calc.
	0.3 - 4.3	(1) 1.0				20% SAND 80% CLAY	CL	1 2 3		SANDY CLAY, MULTICOLORED - grayish brown (5 V12 3/2), moderate yellowish brown (10 V12 5/4), light gray (N0), mod plast, some calc. material, trace of gravel increasing to some quinned at bottom of interval, bottom 2 in - abundant iron staining and concretions, some in top part of interval. iron staining
	4.3 - 5.3	(1) 1.0 0.3				20% SAND 80% CLAY	CL	4 5		Same as above: flamy texture Same as above
	5.3 - 5.5	0.25				1% SAND 99% CLAY	CL	6		CLAY, light olive gray (5 Y 6/1), ext. mod plast, some calc. material, some iron staining as matrix, trace of sand
	5.5 - 7.7	(1) 2.9				100% CLAY	CL	7 8		Same as above: slightly calc. Same as above: yellowish gray (5 Y 8/1)
	7.7 - 8.0	(1) 0.3					CL			Same as above: some silt, some VFG SAND, flamy texture, iron staining
	8.0 - 9.2	(1) 1.6				10% SILT 10% SAND 80% CLAY	CL	9		Same as above
↑ 9.2	9.2 - 10.2	(1) 1.4					CL			
↓ Bot 2 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. 36-86

PAGE 2 OF 2

GEOLOGIST(S): *HAS*
 DATE: *8/22/69*

PROJECT NO: *40-11-2*

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
<i>END OF BOXES</i>							<i>CU</i>	11 12 13 14 15 16 17 18 19		<i>See previous page</i>

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. 38-86

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

USCS symbol
 DATE: *7/25/89*

PROJECT NO: *667-11.22*

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN BOX	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		1.6 ⁽¹⁾	CL				Clay 50%	1		Silty clay. Dark yellowish brown (10yr 4/2) surface grain + roots present. Moderately high plasticity. trace sand.
	2.0A								2		No Sample
	2.8		0						3		Same as above. Less roots + grass. Some subrounded gravel up to 2cm.
	2.8 to 4.0		1.3 ⁽¹⁾	CL				Clay 75%	4		Large cobbles and gravel in sandy clay matrix. Gravel grayish red (10R 4/2) to medium gray (N5). Angular to sub angular. Moderately graded. Sandy clay matrix moderate yellowish brown (10YR 5/4) moderate plasticity.
	4.0 to 6.0		1.6 ⁽¹⁾	GC				gravel 50%	5		
	6.0 to 8.0	5L	1.8 ⁽²⁾	CL				Clay 75%	6		Clay. Dusky yellowish brown (10YR 2/2) high plasticity. trace sand. One large cobble at top. (7cm). Some iron staining. some thin carbonaceous layers.
	8.0								8		
	8.2 to 9.4		1.5 ⁽¹⁾	CL				Clay 75%	9		Silty clay stone. Dark yellowish brown (10YR 4/2). Highly weathered. Slightly friable. Massive bedding. Some carbonaceous material.
	9.4 to 10.0	N.D.						Clay 75%			SAME AS ABOVE
											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.

BR Bkg: 50-150 gpm
 BR Box: = Bkg

LOG OF BORING NO. 38-86

PAGE 2 OF 2

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

DATE: 7/25/89

PROJECT NO: C667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN CORE INTERVAL	SAMPLE NUMBER	FEET OF CORE (IN FOOT INTERVAL)	FEET OF CORE (IN FOOT INTERVAL)	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
10.0			.7(1)						Silt >50%		---	Clayey siltstone. Dark yellowish brown (10yr 4/2) highly weathered. Slightly friable. Massive bedding(?) Some carbonaceous material. Some iron stains.
to 11.3									11	---		
11.3			.9(1)						Silt >50%		---	Same as above
to 12.0									12	---		
12.0			N.D.								---	Same as above, moderately friable.
to 13.0									13	---		
13.0			.5(1)						Silt >50%		---	Same as above, slightly friable.
to 14.0			.4(1)						14	---		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.

RB-Box := Background

LOG OF BORING NO. 39-86

PAGE 1 OF 4

GEOLOGIST(S): *Day*
 DATE: 8/18/69

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	0.0-0.5					60% SAND 25% GRAVEL 15% SILT	GC			GRAVELLY CLAYEY SAND, dark yellowish brown (10 YR 4/2), subangular - subrounded, mod quacled, max grain size = 3.5mm, some roots
	0.5-5.0	(1)				90% GRAVEL 10% SAND	GC	1	0	Calcareous gravel, ^{Top} is moderate yellowish brown (10 YR 5/4), ^{Bottom} is pale yellowish brown (10 YR 6/2), angular - subangular, max size = 7cm, mod quacled
		0.0						2	0	
								3	0	
								4	0	
								5	0	
	5.0-7.5	(1)				70% GRAVEL 30% SAND	GC	6	0	Calcareous SANDY GRAVEL, matrix color is light brown (5 YR 5/6), angular - subangular, mod quacled, max size = 6cm, some cl to MG-VCG, some clay
		0.6						7	0	
								8	0	
	7.5-10.0	(1)				65% GRAVEL 35% SAND	GC	9	0	same as above
		0.6								

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. 39-86

PAGE 2 OF 4

GEOLOGIST(S): *DLW*
 DATE: 8/13/67

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	10.0 -125	(1) 1.0				70% GRAVEL 30% SAND		11	D D D D	TOP 6 IN OF INTERVAL: CALcareous SANDY GRAVEL, matrix color is light brown (5 Y 5/6), angular-subangular, mod-graded, max size = 6cm, S-d is MG - VCA
	12.5 -168	(1) 1.1				60% GRAVEL 40% SAND		12 13 14 15 16	D D D D D D D D	BOTTOM 6 IN OF INTERVAL: CLAYEY SAND, Very pale orange (10 YR 8/2), angular-subangular, mod-poorly graded, trace of biotite(?) SAND, GRAVEL, matrix color is light brown (5 Y 5/6), angular-subangular, med-well graded, max size = 6cm, Some clay esp. @ bottom of interval, slightly calc.
	16.8 -225	(1) 2.1						17 18 19	D D D D D D	Same as above; trace of clay, v. slightly calc.

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. 39-86

PAGE 3 OF 4

GEOLOGIST(S): *Day*
 DATE: *8/13/89*

PROJECT NO: *447-11-27*

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	16.8 -225	12						21	D	See previous page		
							22	D				
	22.5 -235		(1)					23	D		Sandy Gravel, matrix color is light brown (5Y 5/6), angular - subangular, med-well graded, max size = 6 cm, trace of clay	
			12					24	D			
								25	D			
								26	D			
								27	D			
								28	D			
	27.5 -305		(1) 0.1						29		D	same as above
											D	

NOTES: General USCS is modified for this log as follows:
 Material amounts are estimated by % volume instead of % weight.
 (1) Body 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. 39-86

PAGE 4 OF 4

GEOLOGIST(S): *WJ*
 DATE: 8/18/59

PROJECT NO: 66-13-1

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
<i>Box 1 of 2</i>								0-0		CLAYEY GRAVEL, very pale gray (10 YR 8/2) angular - sub-angular, med grading, max amp = 4mm,
<i>31.0</i>	30.5 -31.0	ND						31		CLAY (SILTY), very lt. gray (2.5) and greyish-orange (10 YR 7/4), med-high plast. some very fine (Vf) sand.
<i>*</i>	31.0	1.1 ⁽¹⁾						32		SAME AS ABOVE; TRACE OF CARB. MATERIAL
<i>*</i>	32.5 32.5 -35.0							33		SILTY CLAY, brownish gray, (5 YR 4/1) med-high PLAST. ABUNDANT CARB MATERIAL; SOME IRON staining, WITH CARB.
<i>*</i>	35.0	1.9 ⁽¹⁾						34		BOTTOM OF INTERVAL, SAME AS ABOVE olive black (5 Y 2/1)
<i>Box 2 of 2</i>	35.0 -37.0							35		SAME AS ABOVE. olive gray (5 Y 4/1) NO TRACE MATERIAL. Trace of iron staining along fractures
<i>Box 2 of 2</i>	37.0	2.7 ⁽¹⁾						36		
<i>End of Box</i>								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.

* ERASE TO CORRECT LINE MEASUREMENT *WJ*

LOG OF BORING NO. 40-82

PAGE 2 OF 7

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
	61.2	(1)				50% clay				
	to	4.5								
Box 1	66.2							66	---	claystone as above color changes to medium gray (NS) with some carbonaceous mineralization occurring locally slickensides occur at ~66.3 ft.
	66.2							67	---	
	to	ND						68	---	claystone as above color grades to med. light gray (NG) at ~68 ft slickensides occur at ~68.2 ft decrease in amount of carb. mineralization below ~69 ft.
	69.2							69	---	
↑	69.2	ND								
	69.7							70	---	
↓	69.7									
	to	ND						71	---	
Box 2	71.2							72	---	
	71.2							73	---	
	to	ND						74	---	
	73.7									
	73.7									
	to	ND								
	76.2									

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. 40-86

PAGE 3 OF 7

GEOLOGIST(S): JCB

DATE: 8/20/87

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
	73.7 to 76.2	ND				Clay 75%		76		Clay Stone as above
	76.2 to 79.5	ND						77		Bedding may be horizontal based on appearance of core breaks and slab at 79.5 & 81.
	79.5 to 81.2	ND					78			
	81.2 to 83.7	ND						79		Bedding appears to be 1 cm in thickness, bedding features are irregular surfaces that may be erosional surfaces.
	83.7 to 86.2	ND					80			
								81		
								82		
								83		
								84		Claystone, medium dark gray (N4), bedding not apparent, weathered, slightly friable, local carb. mineralization slight to moderate silt 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. 40-86

PAGE 4 OF 7

GEOLOGIST(S): DCB

DATE: 2/22/87

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
30 ft ↑	83.7					Clay				Claystone as above
	to	ND				>50%				
5 ft ↑	86.2							86		color grades to very light gray (N5) at 87 ft. and carb. mineralization is absent, increase in silt fraction.
	to	ND						87		
↑	88.0	88.0						88		increase in silt fraction.
	88.0	88.0						89		
↓	to	ND						90		Siltstone and claystone interbedded, medium gray (U5) to light gray (N5), thin (<2mm) hor. silt beds interbedded with claystone, interval exhibits soft medium deformation, slightly friable, occasional carb. mineralization, local iron staining below 91.6 ft. and increase in silt component.
	90.9					-60% clay		91		
↓	90.9					-40% silt		92		hor. silt beds interbedded with claystone, interval exhibits soft medium deformation, slightly friable, occasional carb. mineralization, local iron staining below 91.6 ft. and increase in silt component.
	to	ND				-55% clay		93		
						-45% silt		94		
	95.9									

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. 40-86

GEOLOGIST(S): *D CB*
 DATE: *8/28/89*

PROJECT NO: *667-11-2*

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
<i>4 1/2</i>	90.9 to	<i>ND</i>				<i>>500 clay</i>				<i>S. Ft. Stone and Claystone as above</i>
<i>Bot</i>	95.9 95.9						96			
<i>↑</i>	to	<i>ND</i>					97			
<i>97.3</i>	97.3						98			
<i>↓</i>	to	<i>ND</i>					99			
	100.9						100			
<i>Bot</i>	100.9						101			
	to	<i>ND</i>					102			
	104.4						103			
	104.4 to 105.9	<i>ND</i>					104			
									<i>Claystone, medium to (ft gray (NG) bedding not apparent, weathered)</i>	

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. 40-86

PAGE 6 OF 7

GEOLOGIST(S): DCB

DATE: 8/22/89

PROJECT NO: 67-11.22

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+ 50+ ↑	104.4 to	ND				v50- clay				(cont'd. from previous page), slightly friable, moderate silt component, occasional carb. mineralization
	105.9 to						106			
106.6 ↓	105.9 to	ND								
	106.6 to							107		
								108		
								109		
								110		slickensides at ~110 ft., attitude ~55°
								111		
								112		
								113		
								114		Faint slickensides at ~114 ft., attitude ~55°
								115		

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. ^{DCB} 40-86 PAGE 7 OF 7

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

PROJECT NO: 667-11.2.2

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
↑ 116.4	112.9 to 115.9	ND				>50% clay			---	Claystone as above
	115.9 to 116.4	ND						116	---	
↓ 116.4	116.4 to							117	---	
								118	---	
↑ 124.3	120.2 to 120.2					~80% silt 5% sand ~5% clay		119	---	Interval grades to a sandy siltstone at ~119 ft. Sandy siltstone, very light gray (N7) to light gray (N7), bedding exhibits extensive soft sediment deformation and interfractures, slightly friable, sand component is up, slightly friable.
	120.2 to							120	---	Interbedded, siltstone and sandstone very light gray (N8) to light gray (N7) thin bedded ≤ 5mm, soft sediment deformation occurs in this interval, slight to moderate friability, thin discontinuous coal beds, local iron staining.
	123.2 to 123.2							121	---	
	to							122	---	Silty claystone, light gray (N7), thin bedded (22mm), slightly friable, occasional carb. mineralization
	123.2 to							123	---	
	to							124	---	Bottom of box 7 at 124.8 ft.
	124.2 to								---	

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. 41-86

PAGE 1 OF 5

GEOLOGIST(S): *Law*

DATE: 3/25/89

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 ↓	0.0-2.0	(1) 1.65				70% clay 30% silt	CL SP GC	0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0		<p style="text-align: center;">SILTY</p> <p>TOP 2 IN: Clay, dark yellowish brown (10 YR 4/2), mod plast., some sand (VFG-MG), trace of gravel. Highly calcareous. Some calc. frags.</p> <p>2 IN - 12 IN: CALcareous GRAVELLY SAND, matrix color is pinkish gray (5 YR 8/1), sub angular - sub rounded, mod-well graded, max gravel size = 5mm, sand to FG-MG, some clay, some waste.</p>
	2.0-4.0	(1) 1.9					GC	2.0 2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9 3.0 3.1 3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 4.0		<p>12 IN - 1.65 FT: SANDY GRAVEL, dark reddish brown (10 R 3/4), angular - sub angular, mod grad, max gravel size = 4cm, some clay, some waste.</p>
	4.0-6.0	(1) 1.9					GC	4.0 4.1 4.2 4.3 4.4 4.5 4.6 4.7 4.8 4.9 5.0 5.1 5.2 5.3 5.4 5.5 5.6 5.7 5.8 5.9 6.0		<p>TOP 2 IN - same as above</p> <p>CALcareous GRAVEL, mod orange pink (5 YR 8/4), angular - sub angular, mod-poor grad, max gravel size = 5cm, some abundant iron staining, some sand, some waste.</p>
	6.0-8.0	(1) 1.8					GC	6.0 6.1 6.2 6.3 6.4 6.5 6.6 6.7 6.8 6.9 7.0 7.1 7.2 7.3 7.4 7.5 7.6 7.7 7.8 7.9 8.0		<p>Same as above; max size = 7cm at base of interval, base of interval has little clay and is very pale orange (10 YR 9/2)</p>
	8.0-10.0	(1) 1.4					GC	8.0 8.1 8.2 8.3 8.4 8.5 8.6 8.7 8.8 8.9 9.0 9.1 9.2 9.3 9.4 9.5 9.6 9.7 9.8 9.9 10.0		<p>Same as above; increased clay content</p>

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. 41-86

GEOLOGIST(S): *Ray*
 DATE: 8/25/89

PROJECT NO: 467-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE 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 -22.0	1.9				80% GRAVEL 10% SAND 10% CLAY	GC	21		CLAYEY SANDY GRAVEL, matrix color is light brown (5 YR 5/6), subangular - subrounded, med. poorly sorted, max gravel size = 6 cm, sand is F6-MG-CG; top of interval has larger fraction of clay (i.e. 30%)
	22.0 -24.0	1.8				70% GRAVEL 15% SAND 15% CLAY	GC	22 23		See as above; increased clay & sand fractions
	24.0 -26.0	1.7				70% GRAVEL 15% SAND 15% CLAY	GC	24 25		See as above:
	26.0 -28.0	1.7				80% GRAVEL 10% SAND 10% CLAY	GC	26 27		See as above; increased gravel fraction
	28.0 -30.0	1.8				70% GRAVEL 15% SAND 15% CLAY	GC	28 29		See as above; decreased gravel fraction
30.0 ↑										

Box 3 of 45

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. 41-86

PAGE 4 OF 5

GEOLOGIST(S): *[Signature]*
 DATE: 8/25/59

PROJECT NO: 61-2-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE OF 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 -31.5	(1) 6.4 (w/0.5 OF CORE - NOT LOGGED)				55% CLAY 45% GRAVEL	CL	31	0-2 0-0 D-2 -D-	Generally CLAY, dark yellowish orange (10 YR 6/6), mod-poor plast, some SAND flamy texture
	31.5 -32.2	∅						32	X	NO SAMPLE
	32.2 -32.5	0.3 ⁽¹⁾				35% SAND 65% GRAVEL	GC		0.0 0.0 0.0	SAND, GRAVEL, grayish orange (10 YR 7/4), sub angular-angular, mod grad, max size 4 mm, some clay, flamy texture, sand is
	32.5 -32.8	0.2 ⁽¹⁾				23% SAND 80% GRAVEL	GC		0.0 0.0	Sand is sub angular, higher gravel fraction
	32.8 -33.3	1.0 ⁽¹⁾				65% GRAVEL 35% SAND	GC	33	0.0 0.0 0.0	Same as above: angular-subangular, decreased gravel fraction
	33.3 -34.0	0.8 ⁽¹⁾				65% GRAVEL 35% SAND	GC		0.0 0.0	Same as above:
	34.0 -36.0	1.1 ⁽¹⁾				65% GRAVEL 35% SAND	GC	34	0.0 0.0 0.0	Same as above: increased clay fraction, slightly consolidated
	36.0 -36.5	0.7 ⁽¹⁾				55% GRAVEL 45% SAND	GC	35	0.0 0.0 0.0	Same as above: increased sand fraction, gravel is subangular-subrounded,
	36.5 -37.0	1.0 ⁽¹⁾					GC	36	0.0 0.0 0.0	Same as above: angular-subangular
	37.0 -38.5	1.8 ⁽¹⁾				15% GRAVEL 30% CLAY 55% SAND	SC	37	0.0 0.0 0.0	Gravelly clayey sand, grayish orange (10 YR 7/4), mod grad, sand is VFG-MG, max gravel size 3 mm, bottom of interval, sand is FG-MG.
	38.5 -39.0	0.7 ⁽¹⁾				15% GRAVEL 65% SAND 20% CLAY	SC	38	0.0 0.0 0.0	Same as above - sand is FG-MG
	39.0 -40.0	0.6 ⁽¹⁾				10% GRAVEL 50% SAND 40% CLAY	SC	39	0.0 0.0 0.0	TOP 2 in: Same as above, sand is MG-VCG BOTTOM OF INTERVAL: Same as above, sand is VFG-FG, increased 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.



ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 41-86

PAGE 5 OF 5

GEOLOGIST(S): *dky*
 DATE: 8/28/57

PROJECT NO: 657-1122

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
	40.0-41.5	(1) 1.1				20% GRAVEL 35% CLAY 55% SAND	SC	41		GRAVELLY CLAYEY SAND, grayish orange (10 yr 5.5), sub-angular-subrounded, med. quartz, sand is VFG-MG, max gravel imp 5.5, some iron staining as mottles.
	41.3-41.7							X	X	NO SAMPLE
Box 5 of 5 ↑ 44.0	41.7-43.5 43.0	(1) 1.0				30% GRAVEL 30% CLAY 40% SAND	SC	42		See as above. increased gravel fraction
	43.0-43.5 0.5	(2)				30% GRAVEL 30% CLAY 40% SAND	SC	43		See as above
	43.5-44.8	(1) 1.3				40% GRAVEL 30% SAND 20% CLAY	GC	44		See as above CLAYEY SANDY GRAVEL, grayish orange (10 yr 7.5), sub-angular-subrounded, mod. highly graded, max size = 7mm, sand is FG-VG, trace of iron staining BOTTLE ZINC CLAY STAINING
								45		(clayey sand), very pale orange, iron non-apparent. Decid. well weathered, mod friable, some Mg staining, trace of iron staining
								46		
								47		
								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.



ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 42-86		PAGE 1 OF 4								
PROJECT NO: 607-112		DATE: 8/28/79								
GEOLOGIST(S): JPH		DATE:								
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
2.0	3.3	1.3	9(5)			Gravel 75%	GC	3		Gravel, matrix sandy clay + calcareous white (19) to dk. yellowish gray (16). Est. part. low to med. Some hard - v. fig. to v. c.g. Gravel, same as above.
4.1	5.0	0.9	9(6)			Gravel 75%	GC	4		Gravel, same as above.
5.0	5.9	0.9	9(7)			Gravel 75%	GC	5		Gravel, same as above.
6.5	7.0	0.5	7(1)			Gravel 75%	GC	6		Bandy gravel. Reddish color med. dk. gray (14) well graded, grading to 4.5 cm. Angular to sub rounded. Sand v. fig. to v. c.g. Some clay. Trace calc. Same as above, less sand + clay. Gravel to 5 cm.
8.0	11.5	3.5	2(5)			Gravel 75%	GC	7		Gravel. Grayish red (8R4.2) Angular. Partly graded. 3 cm to 6 cm. Some silty clay. Trace calc. CO3.
9										No sample
Beginning of Boxes										

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

LOG OF BORING NO. 42-86

PAGE 3 OF 4

GEOLOGIST(S): UAA

DATE: 8/22/89

PROJECT NO: 6.7-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE 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	20.0					Gavel 50%	GC	20	o o o o o	Gravelly sand. UAA. See previous page description for 17.5-17.5. That description should be here.
	21.3	1.3 (1)				Sand 50%	SC	21	o o o o o	Clayey sand. UAA Gravelly Sandy Clay. Mod. yellowish brown (10yr 5H). Est. plast. Low v.f.g. to granules. mod. graded. Gravel, sub rounded, to 5cm. Some silt.
	21.7	0.4 (1)				Sand 50%	SC	22	o o o o o	
	23.0	1.6 (1)				Sand 50%	SC	23	o o o o o	Same as above.
Box 3 of 3	25.0	1.1 (1)				Sand 40% Gravel 2-10%	GC	24	o o o o o	Clayey sand + gravel. Grayish orange (10yr 7H to 10yr 5H). Gravel sub angular to rounded. Well graded. Granules to 4.5 cm. Sand mod. well graded, v.f.g. to v.e.g. Some silt. Trace iron staining
	26.0	0						25	X	No Sample,
	27.0					Sand 50%	SW	26	X	
	29.0	2.0 (1)	UAA #17					27	o o o o o	Gravelly sand. Grayish orange (10yr 7H). Sand mod. well graded v.f.g. to granules. Gravel sub angular to sub rounded. (.75 cm to 5.5 cm) mod. graded.
	31.0	1.35 (1)				Clay 50%	CL	28	/ / / / /	Very Silty Clay. Pinkish gray to very pale orange (5yr 8H to 10yr 8B). Plast. mod.
								29	/ / / / /	Silty Claystone. Pinkish gray (5yr 8H) to dk. yellowish orange. (10yr 7H) mod. well graded, slightly to mod. friable. Bedding not distinct. 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. 42-86

PAGE 4 OF 4

GEOLOGIST(S): UAF

DATE: 8/28/81

PROJECT NO: (17-172)

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	29.01								/ / / / /	See previous page for description.
	31.0							31	/ / / / /	Silty claystone, Grayish orange (log 7/4) to pinkish gray (log 8/1). Mod. weathered, mod. friable. Bedding not evident. Some gravel + sand (probably from above. Some iron staining). Same as above (No sand + gravel.)
	31.4	.30				Clay 5%		32	/ / / / /	
			1.1(1)				Clay 75%		33	
	33.0							34	X	No sample
35.0	35.0						35	X	Bottom of Boxes	
								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. 43-86

PAGE 1 OF 3

GEOLOGIST(S): DCB
DATE: 2/15/89

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					>50% Gravel	GC	0.0	0.5 1.0 1.5 2.0	Clayey Gravel, dominantly light gray (N1), matrix is brownish gray (5 YR 4/1) to white (N9) angular to subrounded, poorly graded, max size 6.5 cm, some roots and caliche, caliche rind occurs in some gravel.
	1.0	ND						1	X	No Sample
	4.0	0						2	X	
	3.0					>50% clay	CL	3	X	Generally clay, pale yellow to brown (10 YR 6/2), medium to coarse sand.
	4.0	0						4	X	No Sample
	4.0	(1)				>50% clay	CL	5	X	
	5.0	.45						6	X	As above (reference interval 3.0 to 3.35 ft.), trace of vlg sand.
	5.0	ND						7	X	No Sample
	5.35	ND						8	X	
	6.0	0				>50% clay	CL	9	X	As above (reference interval 3.0 to 3.35 ft.) with increase in the gravel fraction with depth.
	7.0	(1)						10	X	No Sample
	8.0	1.0						11	X	
	8.0					>50% clay	CL	12	X	Sandy clay with gradual change to silty sand and silty clay.
	9.0	ND	2CB-7			>50% sand	SP	13	X	Silty sand, light brown (5 YR 6/4), sub-angular to subrounded, poorly graded, medium to very fine grained, some clay, trace of gravel.
	10.0					>50% fine sand		14	X	

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.

Erasmus 2/15/89 DCB corrected column misreading



ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 43-876

PAGE 2 OF 3

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

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
	10.0					>50% sand	SP			As above
	to	ND				>50% sand	GC	11		Sandy Clayey Gravel, light gray (N7), subangular to sub rounded, poorly graded, max. size is 6.5 cm., some silt, - matrix is grayish orange (10 YR 7/4).
	12.0							12		
	to	ND	DCB-8					13		
	13.3	13.8						14		
	13.8	14.0	ND					15		
	to	ND						16		
	15.5	15.5	(1)			>50% sand	ML	17		Sandy silt, grayish orange (10 YR 7/4), trace of gravel and clay.
	to	.25						18		
	16.5	16.5						19		
	to	ND				>50% sand		20		As above with a cobble of 17.0
	18.0	18.0	ND					21		From 17.0 ft. to 18 ft. sandstone mottled light gray (N8) to dark yellowish orange (10 YR 6/6), mottled very fine grained, slight silt fraction, bedding not apparent, highly weathered, moderately friable.
	to	ND						22		Silty sandstone, very light gray (U8) with iron staining, dark yellowish orange (10 YR 6/6), bedding not apparent, highly weathered, moderately friable.
	20.0									

Corrected
8/15/89
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

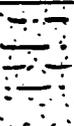
FIGURE NO.

LOG OF BORING NO. 43-86

PAGE 3 OF 3

GEOLOGIST(S): *CCB*
 DATE: *2/15/89*

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
<i>Box 2 of 2</i>	20.0 to	<i>ND</i>						21		<i>friable trace of dark mineral (possible iron oxides) on fracture face.</i>
	20.8 to									<i>Sandstone, very light gray (US) to grayish orange (10-12 R 7/4), beddy not apparent, well weathered, silty, silty to moderately friable, very fine grained, well sorted, rounded to well rounded.</i>
<i>22.0</i>	22.0							22		
								23		<i>Bottom of Box 2 of 2 at 22.0 R4.</i>

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. 44-86

PAGE 1 OF 4

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

USCS Symbol
 DATE: 7/25/89

PROJECT NO: G67-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE (IN BOX)	FEET OF CORE (IN FEET)	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0								Gravel > 50%			Gravel in sandy silty clay matrix very broad range of colors in gravel. None predominant. Angular to sub-rounded. Well graded. Maximum size visible - 6.5 cm. Clay matrix - moderate brown.
	to 1.4				75(1)	GC				1		
	1.40								"	2		Same as above
	to 5.0				80(1)	GC				3		
	5.0								"	4		
	to 8.0				9(1)	GC				5		Same as above. Sample more pulverized. (matrix broken up.)
	8.0								"	6		
	to 10.5									7		Same as above except color change in matrix to moderate yellowish brown. (10yr 5/4).
					1.3	GC			"	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.

Box 80 > 50 - 200 cpm
 Rocky ground BX - 50 - 200 cpm.

LOG OF BORING NO. 44-86

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

USES & SYMBOL
 DATE: 7/25/89

PROJECT NO: G67-11.22

TOP/BOTTOM OF BOX IN BOX	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE (IN BOX INTERVAL)	FEET OF CORE (IN LOG)	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	10.5 ↑ 10.5		.8	GC				Gravel >50%	11	○	Gravel in sandy silty clay matrix. Gravel predominantly med. dark gray. Subangular to sub rounded. Matrix moderate yellowish brown. with well graded sand.
	to 12.0 12.0								12	○	
	to 15.5		○						13	X	No Sample
	15.5 to 16.5	1.6		CL			Clay >50%	16	▨	Silty clay. Dark yellowish orange. (10yr 6/6) moderate plasticity. Some gravel (to 1.5cm) some iron staining. Trace sand.	
	16.5 to 18.0	N.D.		ML &					17	▨	Clayey siltstone, dark yellowish orange (10yr 6/6) to very pale orange (10yr 8/2) to yellowish gray (5y 8/1). Trace carbonaceous material. Trace iron staining.
New box ↓	18.0 to 20.5		2.8	ML			Silt >50%	18	▨	Clayey siltstone. Dark yellowish orange (10yr 6/6). Some well sorted fine grained sand throughout. Trace carbonaceous materials.	
New box ↓									19	▨	

NOTES: General: The uses is modified for this log as follows:
 Material amounts are estimated by percent volume instead of percent weight.
 (1) 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 - 50-150 cpm.

LOG OF BORING NO. 44-86

PAGE 3 OF 4

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

USCS SYMBOL
 DATE: 7/25/87

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOI	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FEET OF CORE IN BOI	FEET OF CORE IN FEET	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOG LOC	LITHOLOGIC DESCRIPTION
	20.5											
	20.5				SW				Sand 50%	21		Clayey sand. Dark yellowish orange to very pale orange (10yr 6/6 to 10yr 8/2), well graded. Very fine grained to coarse grained. Trace very coarse grained. Subangular to subround. Sufficient clay content to create moderate to high plasticity.
	to		2.8 (1)		W/ fines				Clay 50%	22		
	23.0											
	23.0				GW				Gravel 20%	23		Clayey sand and gravel. Light brown to very pale orange (5yr 8/6 to 10yr 7/4) Gravel angular to subrounded sand subangular to sub rounded. Well graded. Fine sand to granules, fine gravel to pebbles. Max. size 2.5 cm. Sufficient clay to create low plasticity. Increased clay content, decreased gravel content at bottom of interval.
	to		2.5 (1)		W/ fines				Sand 50%	24		
	25.5								Clay 30%	25		
	25.5								Clay > 50%	26		Silty clay. Dark yellowish orange (10yr 6/6) to yellowish gray (5y 8/1). High plasticity. Trace sand (Possibly highly weathered claystone) Slightly friable to friable
	to		1.4 (1)		CH							
	26.5									27		SAME AS ABOVE. Trace carbonaceous material.
	to	SL	1.8		CH							
	28.0									28		Silty clay. yellowish gray (5y 7/2). High plasticity. Trace sand. Trace white mineralization (unidentified). Does not react with dilute HCl. *Possibly highly weathered claystone. Slightly friable. Horizontal to convoluted bedding.
	to		1.7		CH				Clay > 50%	29		
	30.5											

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.

Box 3 - 50 to 150 cpm.

LOG OF BORING NO. 44-86

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

USGS SYMBOL
 DATE: 7/26/89

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN LOG	SAMPLE NUMBER	FEET OF CORE IN BOX	FEET OF CORE IN LOG	FRAC. PER FOOT	FRAC. ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
↑ 30.5 ↓ 30.5 ↑ 33.0	↑ 30.5 ↓ 30.5 ↑ 33.0	SL (1)	CH	CH				Clay 75%	31 32 33		Silty clay, possibly highly weathered claystone. Yellowish gray (5Y7/2). High plasticity. Trace sand. No Hcl reaction. If claystone slightly friable. Horizontal to convoluted bedding.
Total Depth 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. 45-86

PAGE 1 OF 4

GEOLOGIST(S): *WJ*

DATE: 8/24/87

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	GRAN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0-0.3	(1) 0.6				20% clay 30% Gravelly 50% SAND	SC		0	Clayey Gravelly SAND, dark yellowish brown (10 YR 4/2), subangular-angular, sand to FG-CG, max gravel size = 4 cm, some roots mod-poorly sorted
	0.3-5.0	∅						1 2 3 4	X	NO SAMPLE
Box 1 of 4	5.0-7.0	(2) 2.8				45% SAND 40% CLAY 15% Gravel	SC	5 6	3 4	Same as above Gravelly Clayey SAND, light brown (5 YR 5/6), subangular-angular, sand to FG-MG, max gravel size = 5 cm, some silt, mod-poorly sorted
	7.0-9.3	(1) 2.5				55% SAND 35% CLAY 10% Gravel	SC	7 8 9	5 6 7	Bottom 2 ft of interval 5.0-7.0: SANDY CLAY, light brown (5 YR 5/6), mod-high plastic, some gravel, sand to VFG-MG, mod-poorly sorted
										Gravelly Clayey Sand, light brown (5 YR 6/4), angular-subangular, mod grading, sand to FG-MG, max gravel size = 3 cm - trace of mica
	9.3-21.3	∅						10	X	

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. 45-86

PAGE 2 OF 6

GEOLOGIST(S): *MS*
 DATE: *8/20/87*

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
<i>Box 1 of 4</i>	<i>(9.3 - 21.3)</i>	ϕ						11 12 13 14 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. 45-86

PAGE 3 OF 2

GEOLOGIST(S): *Ray*
 DATE: 8/20/89

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
	19.3 -21.3							-21-		NO SAMPLE
	21.3 -23.8	(1) 0.4				55% SAND 35% CLAY 10% GRAVEL		-22- -23-		GRAVELLY CLAYEY SAND, light brown (5 YR 6/4), angular-subangular, mod graded, sand is FG-MG, max gravel size = 3mm, trace of mica
Box 1 of 4	23.8 -28.3	∅						-24- -25- -26- -27- -28-		NO SAMPLE
	28.3 -30.2	(2) 2.3				40% SAND 30% CLAY 30% GRAVEL		-29-		Same as above: very pale orange (10 YR 8/2), mod-poorly graded, sand is FG-CG,

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. 45-80

GEOLOGIST(S): *WJ*
 DATE: 8/20/52

PROJECT NO: 617-1122

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
30.2	30.2 - 31.2	ND				50% SAND 35% CLAY 15% GRAVEL		31		See previous page GRAVELLY CLAYEY SAND, very pale orange (10 YR 8/2), angular-subangular, sand to FG-MG, max gravel size = 3cm, mod-poorly graded, trace of iron staining Same as above; bottom of interval - fraction of gravel is higher
	31.2 - 33.2	(2) 2.5				55% SAND 30% CLAY 20% GRAVEL		32		
	33.2 - 33.9	(1) 0.4				20% CLAY 50% SAND 30% GRAVEL		33		
	33.9 - 38.2	(1) 1.8				70% GRAVEL 30% SAND		34		SANDY GRAVEL, dark yellowish orange (10 YR 6/6), angular-subangular, mod-well graded, max size = 7cm, sand is MG-CG, trace of clay
	38.2 - 40.7	(1) 1.5						35		CLAYEY SANDY GRAVEL, light brown (5 YR 5/6) sub angular-sub rounded, mod-well graded, max size = 8 cm
								36		
								37		
								38		Same as above: angular angular-subangular
								39		

Box 2 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.



LOG OF BORING NO. 45-86

GEOLOGIST(S): *LAG*
 DATE: *2/21*

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
<i>Box 2 of 4</i>	40.7 - 43.2	<i>(1)</i> 1.5				20% CLAY 30% SAND 50% GRAVEL		41	<i>(Symbol: small circles and dashes)</i>	See previous page CLAYEY SANDY GRAVEL, light brown (5 Y 5/6), subangular, angular, unsorted, max smp = 4 cm
	43.2 - 45.7					60% SAND 40% GRAVEL		44	<i>(Symbol: small circles)</i>	GRAVELLY SAND, dark yellowish orange (10 YR 6/6), subangular - subrounded, mod-poorly sorted, max gravel smp = 3 cm, sand is MG-VCS, some clay
	45.7 - 48.2					60% SAND 40% GRAVEL		46	<i>(Symbol: small circles)</i>	Same as above: trace of clay, bottom of interval contains some possible well weathered chert.
<i>Box 3 of 4</i>	48.2 - 49.7				60% SAND 40% GRAVEL		49	<i>(Symbol: small circles)</i>	dark yellowish orange (10 YR 6/6) and pinkish gray (5 YR 5/1) some clay	
<i>↑</i> 49.7	49.7 - 52.3								<i>(Symbol: X)</i>	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.



LOG OF BORING NO. 45-86

GEOLOGIST(S): *ML*

DATE: 8/2/89

PROJECT NO: 417-1122

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 406 &	49.7 -52.7	0						51 52	X	NO SAMPLE
	52.7 -53.5					100% clay		53	---	clay (possibly well weathered CHALYSTONE) Very pale orange (10 YR 8/2), non apparent bedding, well weathered, moderate some silty, some iron staining as invertebrates, trace of Mg staining.
Bottom of Boxes								54		
								55		
								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.



ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 46-86

PAGE 1 OF 2

DATES DRILLED:
 ELEVATION:
 GEOLOGIST(S): DCJ
 DATE: 1/25/89
 CHECKED BY:

USCS Symbol

DATE:

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN LOG	SAMPLE NUMBER	FEET OF CORE IN BOX	FEET OF CORE IN LOG	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
91.0 ↓	91.0								91		No Sample
	to								92		
Box 1 of 4			0						93		
									94		
									95		
	102								96		
									97		
									98		
									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. 46-87

PAGE 2 OF 2

DATES DRILLED:
 ELEVATION:
 GEOLOGIST(S): DCB
 DATE: 7/25/59
 CHECKED BY:

USCS Symbol

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN FACTA	SAMPLE NUMBER	FEET OF CORE IN BOX	FEET OF CORE IN FACTA	DATE	USCS SYMBOL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
91.0	to		0								101		No Sample
102											102		
102	to	(1)	4				65°			>50% clay	103	Silty Claystone, light olive gray (5 Y 6/1), bedding not apparent (massive?) weathered moderately friable, a discrete body of fine sand occurs in the upper .2 ft. of this interval, iron stains occur on fractures, slickensides occur at ~105.4 ft. and the silt fraction decreases.	
105											104		
105											105		
to		(1)	1.15								106		
109.5	SL										107		
109.5	to	(1)	.5								108		
112.5											109		
													Claystone - grayish orange (10 YR 7/4), bedding not apparent, highly

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

- (1) 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 50-150 cpm
 B & 50-150 cpm

LOG OF BORING NO. 46-87

DATES DRILLED:
 ELEVATION:
 GEOLOGIST(S): DCB
 DATE: 7/25/89
 CHECKED BY:

USCS SYMBOL

DATE:

PROJECT NO: C67-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN LOG	SAMPLE NUMBER	FEET OF CORE IN BOX	FEET OF CORE IN LOG	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
109.5	to		.5 (1)					25% clay	111	-----	weathered, slightly friable, localized iron staining and possible iron oxides.
DCB to 112.5	112.5		.75 (1)						112	-----	Claystone, light olive gray (5 Y 6/1), highly weathered, highly friable, abundant intraclasts, no subrounded, moderate yellowish brown (10 YR 5/4)
to	to		.75						113	-----	
116.5	to		.25						114	-----	
116.5	to		.25						115	-----	
116.5	to		.25		~90°			>50% clay	116	-----	Claystone, light olive gray, slightly weathered, bedding not apparent (massive), localized iron staining and iron staining on fractures.
118.8	to		1.75						117	-----	
118.8	to								118	-----	Gradational ^{color} change with depth - grayish orange (10 YR 7/4) and silt content increases
120.8	to								119	-----	
								25% 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. 46-576

DATES DRILLED:
 ELEVATION:
 GEOLOGIST(S): DCB
 DATE: 7/25/57
 CHECKED BY:

USES SYMBOL
 DATE:

PROJECT NO: 667-11.22

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF CORE IN LOG	SAMPLE NUMBER	FEET OF CORE IN BOX	FEET OF CORE IN LOG	FRAC. PER FOOT	FRAC. ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	118.0 to 120.0		1.75							///	See previous page
	120.0 to 121.5		ND						121	///	
	121.5 to 124.5		(1) 1.2						122 123	---	Claystone, light gray (N7), bedding not apparent, highly weathered, slightly friable to highly friable somewhat catenaceous (exhibits weak rxn with dilute HCl).
	124.5 to 126.5		(1) 1.6						124 125 126	---	
	126.5 to 129.5		(2) 1.6						127 128	---	Claystone, medium gray (N5), shaly bedding ~ 1 inch thick apparent in upper 4 ft. of this interval, slightly weathered, weak rxn with dilute HCl, slightly friable
	129.5 to 130.5	SL	1.8						129	---	

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



ROCKY FLATS PLANT

FIGURE NO.



ROCKY FLATS PLANT

FIGURE NO.

TOP/BOTTOM OF CORE IN FEET	TOP/BOTTOM OF CORE IN FEET	SAMPLE NUMBER	FRACTURES PER FOOT	FRAC. ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC DESCRIPTION
128.5	128.5						128.5	
129.5	129.5						129.5	
130.5	130.5						130.5	
131.5	131.5	ND					131.5	3 ft thick interval of clay siltstone below 136.5
132.5	132.5						132.5	
133.5	133.5						133.5	
134.5	134.5						134.5	
135.5	135.5						135.5	
136.5	136.5						136.5	
137.5	137.5	ND					137.5	3 ft thick interval of clay siltstone below 136.5
138.5	138.5						138.5	
139.5	139.5						139.5	
140.5	140.5						140.5	
141.5	141.5						141.5	
142.5	142.5						142.5	
143.5	143.5						143.5	
144.5	144.5						144.5	
145.5	145.5						145.5	
146.5	146.5						146.5	
147.5	147.5						147.5	
148.5	148.5						148.5	
149.5	149.5						149.5	
150.5	150.5						150.5	
151.5	151.5						151.5	
152.5	152.5						152.5	
153.5	153.5						153.5	
154.5	154.5						154.5	
155.5	155.5						155.5	
156.5	156.5						156.5	
157.5	157.5						157.5	
158.5	158.5						158.5	
159.5	159.5						159.5	
160.5	160.5						160.5	
161.5	161.5						161.5	
162.5	162.5						162.5	
163.5	163.5						163.5	
164.5	164.5						164.5	
165.5	165.5						165.5	
166.5	166.5						166.5	
167.5	167.5						167.5	
168.5	168.5						168.5	
169.5	169.5						169.5	
170.5	170.5						170.5	
171.5	171.5						171.5	
172.5	172.5						172.5	
173.5	173.5						173.5	
174.5	174.5						174.5	
175.5	175.5						175.5	
176.5	176.5						176.5	
177.5	177.5						177.5	
178.5	178.5						178.5	
179.5	179.5						179.5	
180.5	180.5						180.5	
181.5	181.5						181.5	
182.5	182.5						182.5	
183.5	183.5						183.5	
184.5	184.5						184.5	
185.5	185.5						185.5	
186.5	186.5						186.5	
187.5	187.5						187.5	
188.5	188.5						188.5	
189.5	189.5						189.5	
190.5	190.5						190.5	
191.5	191.5						191.5	
192.5	192.5						192.5	
193.5	193.5						193.5	
194.5	194.5						194.5	
195.5	195.5						195.5	
196.5	196.5						196.5	
197.5	197.5						197.5	
198.5	198.5						198.5	
199.5	199.5						199.5	
200.5	200.5						200.5	

NOTES: General: The USGS is modified for this log as follows:
 (1) Badly broken core, accurate footage measurement not possible.
 (2) Core breaks cannot be marked, accurate footage measurement not possible.
 (3) Core breaks cannot be marked, accurate footage measurement not possible.

141.5
 +0
 (2)
 1.8
 137
 137
 126.5
 126.5
 +0
 (1)
 133
 133
 +0
 (1)
 131.5
 131.5
 ND
 130.5
 130.5
 128.5
 128.5
 126.5
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 122.5
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 12.5
 10.5
 10.5
 8.5
 8.5
 6.5
 6.5
 4.5
 4.5
 2.5
 2.5
 0.5
 0.5

PROJECT NO: G67-1122

USGS symbol

DATES DRILLED: 7/25/80
GEOLOGIST(S): J.S.
ELEVATION:
CHECKED BY: J.S.

LOG OF BORING NO. 46-86

PAGE 6 OF 7

DATES DRILLED:
 ELEVATION:
 GEOLOGIST(S): P.C.S.
 DATE: 7/25/99
 CHECKED BY:

USCS
 Symbol

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
137	to		(2) 1.8								As above see previous page, localized bodies of carbonaceous mineralization
141.5	to		ND					141			
141.5	to							142			
142.7	to		(1) 1.4						143		Claystone, medium gray, (NS), bedding not apparent, probably horizontal based on core breaks, contact with overlying siltstone is gradational, weathered, variable, carbonaceous mineralization occurs along core breaks, possible plant detritus?
144.7	to		.3					144			
144.7	to		(1) .3						145		Siltstone, light olive gray (5 Y 6/1), stratified bedding not apparent (massive?), slightly weathered, slightly variable.
146.5	to		(1) .55					146			
146.5	to								147		
151.5									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.

DATES DRILLED:
 ELEVATION:
 GEOLOGIST(S): DCB
 DATE: 7/25/77
 CHECKED BY:

USCS Symbol

DATE:

PROJECT NO. 667-11.22

TOP/BOTTOM OF CORE IN BORE IN FEET	TOP/BOTTOM OF CORE IN FEET IN INTERVAL	SAMPLE NUMBER	FEET OF CORE IN FOOT INTERVAL	USCS SYMBOL	FRAC. PER FOOT	FRAC. ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
146.5 to 151.5			(1) .55						150		As above see previous page.
151.5 to 152.2			ND						151		
152.2 to 154			(2) 1.75						152		
154 to 154.5			ND						153		
154.5 to 156.5			(2) .75						154		Gradational change at 154.1 ft. Claystone (S 4 G 1) bedding not apparent, weathered, moderately friable. Gradational change to silty stone at 154.5 ft. olive gray (S 4 G 1), bedding not apparent, may be horizontal based on core breaks. Slightly weathered, slightly friable.
156.5 to 156.8			ND						155		
156.8 to 158.8	SL	(2)	1.85						156		Gradational change to silty claystone at 156.5 ft. light olive gray (S 4 G 1), bedding not apparent, weathered, moderately friable.
158.8 to 160.8			1.6						157		Gradational change to siltstone light gray (N8), horizontal bedding 1 mm thick, slightly weathered, slightly friable, a trace of very fine sand occurs in this 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. 46-86 DCE

DATES DRILLED:
 ELEVATION:
 GEOLOGIST(S): DCR
 DATE: 7/25/87
 CHECKED BY:

USGS symbol

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 INTERVAL	FRACTURES PER FOOT	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	DEPTH IN FEET	LITHOLOGIC LOC	LITHOLOGIC DESCRIPTION
	157.8 to 160.9		1.6								From previous log
	160.9 to 161.5		ND						161		A Gradational change occurs at ~157.8. Interval grades to a silt clay and then a Claystone by 158.8 ft.
	161.5 to 162.5		ND						162		Claystone, light gray (N7), bedding not apparent (massive), slightly friable, carbonaceous mineralization occurs on bedding planes.
	162.5 to 166.5		(1)	1.1					163		Gradational change to siltstone occurs at ~160.5. Siltstone very light gray (N8), bedding not apparent (massive), slightly friable, carbonaceous mineralization occurs on core breaks.
									164		Gradational change to claystone occurs at ~162.0 ft. Claystone, light gray (N7), bedding may be horizontal based on core breaks, weathered moderately friable, some siltstone occur in this interval extends to 166.5 ft.
									165		
									166		
									167		Bottom of Box 4

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



ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 48-86

PAGE 2 OF 15

GEOLOGIST(S): *WJ*
 DATE: 5/17/89

PROJECT NO: *48-86-11*

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
								81	TRANSVERSE	See previous page
	87.2 - 84.0	(2) 1.5		0°-10° 70-90°				82		CLAYSTONE, yellowish gray (5 y @/1) (in to 4 in & bottom 3 in of interval) and light gray (N7) (in middle of interval) massive bedding, mod. friability, iron staining along fractures - fractures are horizontal - near horizontal and 70°-90°, Mg staining along fractures most abundant in the 4 in's.
	84.0 - 84.3	ND						83		Same as above: light gray (N7)
	84.3 - 86.3	(1) 1.8						84		Same as above: light brownish gray (5 YR 6/1)
	86.3 - 88.3	(1) 1.7						85		Same as above:
	88.3 - 89.0	ND						86		Same as above:
	89.0 - 90.5	(1) 0.7				60% silt 40% clay		87		CLAYEY SILTSTONE, yellowish gray (5 Y @/1), massive bedding, mod-low friability, well sorted
								88		

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. 48-86

PAGE 3 OF 15

GEOLOGIST(S): *MS*
 DATE: 8/17/89

PROJECT NO: 662-11.22

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
90.5	89.0 - 89.5									
90.5	90.5 - 92.5					60% clay 40% silt		91 92	- - - - -	SILTY CLAYSTONES, light brownish gray (54 G/I), massive beddy, mod-well weathered mod-poorly friable, trace of iron staining, trace of carb. material
	92.5 - 94.0			70°		75% clay 30% silt		93	- - - - -	Same as above; light olive gray (54 G/I), less silt silt fraction, mod friability, increased some non staining as matter and in fractures @ 70°
	94.0 - 94.3					90% clay 10% silt		94	- - - - -	Same as above
	94.3 - 94.4					80% clay 20% silt		95	- - - - -	Same as above
	96.1 - 98.1					80% clay 20% silt		96 97	- - - - -	Same as above
	98.1 - 99.0					70% clay 30% silt		98	- - - - -	Same as above: increased silt fraction
	99.0 - 104.0					70% clay 30% silt		99	- - - - -	Same as above

Box 2 of 12

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. 48-26

PAGE 4 OF 15

GEOLOGIST(S): *LOJ*

DATE: *8/17/57*

PROJECT NO: *48-11-22*

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
<i>Box 2 of 12</i>										
								101	/ / / / /	<i>See previous page</i>
								102	/ / / / /	
								103	/ / / / /	
								104	/ / / / /	
	104.0 -106.0	(2) 1.8				35% CLAY 65% SILT		104	/ / / / /	<i>CLAYEN SILTSTONE, light olive gray (5 y 4/1), massive bedding, moderately weathered, mod friable, var staining clay fractures, increased clay fraction at bottom of interval.</i>
								105	/ / / / /	
	106.0 -108.0	ND				35% CLAY 65% SILT		106	/ / / / /	<i>Same as above: some carb material</i>
								107	/ / / / /	
	108.0 -109.0	ND				75% SILT 25% CLAY		108	/ / / / /	<i>Same as above: ^{olive gray (5 y 4/1)} greater clay silt fraction, some VFG SAND, horizontal bedding</i>
								109	/ / / / /	
	109.8 -111.5	ND				100% SILT		109	/ / / / /	<i>Same as above: increased amount of carb. material</i>
								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. 48-86

PAGE 5 OF 15

GEOLOGIST(S): *DCS*
 DATE: *7/7/60*

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
								111		See previous page
Box 3 of 12	111.5 - 112.0					55% SAND 35% CLAY 10% SILT		112		CLAYEY SILTSTONE, light olive gray (5 Y 6/10), horizontal bedding, highly weathered, mod friable, some carb material, some iron staining as mottles.
	112.0 - 115.5	(2)	11			35% CLAY 65% SILT		113		Same as above
	115.5 - 117.7	(2)	11			55% SAND 45% CLAY		116		CLAYEY SANDSTONE, light olive gray (5 Y 6/10), highly weathered, mod friable, VFG-FG, mod sorted, clay is interbedded (1 cm - 2 cm) and also "mottles" within sandstone, some iron staining as mottles, some carb material.
Box 4 of 12	117.7 - 118.0	(2)	18			55% SAND 45% CLAY		118		Same as above
	118.0 - 120.1	(2)	18			55% SAND 45% CLAY		119		Same as above: Slabbed core shows horizontal lamellar bedding, soft sediment deformation, abundant carb. material along bedding planes, small iron nodules in beds containing abundant massive (i.e. 1-2 cm) clay beds

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. 48-80

PAGE 6 OF 15

GEOLOGIST(S): *H. J.*
 DATE: 8/17/89

PROJECT NO: 1207-11.22

TOP/SECTION 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 12	120.1 - 122.2	(2) 1.9				55% SAND 45% CLAY		121		See previous page CLAYEY SANDSTONE, light olive grey (5Y 6/1) highly weathered, med friable, dominant laminar bedding, VFG-FG, interbedded clay beds beds, some iron staining, some carb. material coarse bed	
	122.2 - 123.2	(2) 1.0				55% SILT 45%		123		SILTY CLAYSTONE, yellowish grey (5Y 4/6) unmassively bedded, highly weathered, med friable, trace of iron staining	
	123.2 - 124.2							124			
	124.2 - 125.2							125			
	125.2 - 126.2							126			
	126.2 - 127.2							127			
	127.2 - 127.5	ND					SAME				Same as above
	127.5 - 129.5	(2) 1.7					SAME AS ABOVE	128			Same as above: slatted core shows 2-2 cm beds of clay with a "grainy textured" clay between beds (med sandy)
	129.5 - 130.5	ND					95% SILT 5% CLAY	129			CLAYEY SILTSTONE, yellowish grey (5Y 8/1) unmassively bedded, med-poorly friable, trace of iron staining, is bedding indicate possible fractures

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. 48-86

PAGE 7 OF 15

GEOLOGIST(S): *WJ*
 DATE: 8/17/87

PROJECT NO: *48-86-11-2*

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
										See previous page
	130.8 - 132.2	(2) 1.7						131		CLAYEY SILTSTONE, yellowish gray (5 Y 8/1), massive bedding, mod. poorly fissile, trace of carb. material, Grass
	132.2 - 134.2	(2) 1.7						132		Same as above: light olive gray (5 Y 6/1), trace of carb. material
	134.2 - 136.5	(2) 1.8						133		
	136.5 - 137.2	(2) .5						134		Same as above, & some carb. material in top 5 in., some sand at bottom of interval.
	137.2 - 138.5	ND						135		
	138.5 - 140.5	ND						136		
								137		SILTY SANDSTONE, yellowish gray (5 Y 8/1), highly weathered, mod-low fissility, VFG-FG,
								138		Same as above
								139		CLAYEY SILTSTONE, yellowish gray (5 Y 8/1), highly weathered, mod-low fissility, massive bedded, trace of carb. material

Box 5 of 12

 Box 6 of 12

Grass

Grass

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. 48-86

PAGE 8 OF 15

GEOLOGIST(S): *W. J. [unclear]*
 DATE: 8/17/89

PROJECT NO: 667-11.23

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE OF CORE INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 6 of 12	140.5 - 142.2	(2) 1.4						141	.....	Clayey siltstone, yellowish gray (5 Y 8/1), highly weathered, mod-lobed spissinity, massive bedding, trace of carb. material
								142	.....
	142.2 - 144.7	(2) 1.8						143	.....	Same as above
								144	.....
	144.7 - 146.7	(2) 1.8						145	.....	Same as above: abundant carb material in middle of section
								146	.....
	146.7 - 147.2	ND						147	.....	Same as above
147.2 - 148.5	ND						148	.....	
↑ 148.5	148.5 - 151.0	2 1.8						149	.....	Same as above: light olive gray (5 Y 6/1)
Box 7 of 12										

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.

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
										See previous page
1510 - 1522	(2) 0.6				30°	55% SAND 45% SILT		151		SILTY VFG-FG SANDSTONE, yellowish grey (5 y 8/1) - d light olive grey (5 y 6/1) weathered, mod friability, mod sorted. Some clay, trace carb material, trace iron staining.
1522 - 1535	(2) 1.3					30% SAND 70% SILT		152		MASSIVE SILTSTONE, light olive grey (5 y 6/1), beds of sand, highly weathered, mod friable, sand is VFG-FG, mod sorted.
1535 - 1558	(2) 1.6					30% SILT 70% CLAY		153		Silty CLAYSTONE; yellowish grey (5 y 8/1), massive bedded, mod highly weathered, some carb material in top 6 in of interval, trace in bottom, trace of iron staining.
1558 - 1572	(2) 1.3					20% SILT 80% CLAY		154		Same as above.
1572 - 158	(2) 0.4					80% CLAY 20% SILT		155		Same as above.
158 - 160	(2) 1.8							156		Same as above.

Box 7 of 12

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. 48-84

PAGE 10 OF 15

GEOLOGIST(S): *WJ*

DATE: 8/17/89

PROJECT NO: 667-11.2Z

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
	160-162.2	(2) 1.0						161		CLAYSTONE, light olive grey (5 Y 6/1), non-apparent bedding, highly weathered, mod friability, trace of carb material, some silt
								162		
	162.2-163.0	ND						163		Same as above, trace of VFG SAND
	163.0-165.0	(2) 1.9						164		Same as above, some sand as laminae,
	165.0-172.0	(2) 1.6						165		Same as above: olive grey (5 Y 4) no sand
								166		
								167		
								168		
								169		

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.

GEOLOGIST(S): *JKS*
 DATE: 8/17/89

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE OF CORE IN INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
								171		See previous page
	1720-1740 173	ND						172		CLAYSTONE, olive grey (5 Y 6/1), non apparent bedding, highly weathered mod friability, traces of carb. material traces of silt, some of non clay floury texture - trace of non clay
	173-174	(1) 0.7 (1)						173		Same as above
	1740-176	(1) 1.8						174		Same as above: some silt
								175		
	176.0-1780	(2) 1.8		60°				176		Same as above; consolidated texture fracture @ 60°
								177		
	178.0-1800	(2) 1.8		85-90° 30°				178		TOP OF INTERVAL: Same as above, light olive grey (5 Y 6/1) Bottom of interval: same as above, olive grey (5 Y 4/1) and olive black (5 Y 2/1), abundant carb. material fractures @ 85-90° & 30°
								179		

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. 49-86

PAGE 12 OF 15

GEOLOGIST(S): *Day*
 DATE: *8/17/89*

PROJECT NO: *665-1122*

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 9 of 12	180 - 183	(2) 1.8		60° 70°				181		CLAYSTONE, light olive grey (S Y 6/1), beddy non-apparent, highly weathered, mod friable, some carb. material, trace iron staining 60° & 70° fractures
								182		
								183		
								184		
								185		
	183 - 184.5	ND		70°				183		Same as above: bottom of interval is olive grey (S Y 4/1)
								184		
	184.5 - 187	(1) 1.0						185		Same as above: portions of interval have flaky texture
								186		
								187		
	187 - 188	0.6						187		Same as above
								188		
	188 - 190.5	ND		85-90°				188		Same as above: bottom 6 in of interval is light olive grey (S Y 6/1), trace of silt
								189		

NOTES: General: USCS is modified for this log as follows:
 Material amounts are estimated by % volume instead of % weight.
 (1) Body 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. 48-26

PAGE 13 OF 15

GEOLOGIST(S): *Day*
 DATE: 8/17/89

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
	190.5 - 192	(2) 1.2				60% SILT 40% CLAY		191	---	CLAYEY SILTSTONE, light olive grey Yellowish grey (5 Y 8/1), non-apparent bedding, highly weathered, mod-low friability, some carb. material
	192.0 - 193.0	(2) 0.5				70% SILT 30% CLAY		192	---	Same as above: Some iron staining, numerous hairline fractures.
	193.0 - 195.0	(2) 1.6				80% SILT 20% CLAY		193	---	Same as above: Bottom of interval has VFG-FG sand lenses and soft sed deformation
	195.0 - 197.0	(2) 1.6				55% SILT 45% SAND		195	---	<p style="text-align: center;"><i>Seasie has</i></p> SANDY SILTSTONE, yellowish grey (5 Y 8/1) and light olive grey (5 Y 6/1), convoluted bedding w/ 2 types of ^{abundant} sand lenses, (1) VFG, well sorted, 3 cm - 1/2 cm, and 2) FG, VFG, abundant carb material, 1 cm - 1/4 cm) and clay seam pieces, highly mod weathered, mod-low friability, trace of iron staining, trace of carb.
	197.0 - 199.0	(2) 1.8				55% SILT 45% SAND		197	---	
	199.0 - 200.5	(1) 1.8				30% SILT 70% SAND		199	---	SILTY SANDSTONE, light olive grey (5 Y 6/1), horizontal laminar bedding w/ some massive bedding at 200 ft and some interbeds of siltstone, highly

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. 48-26

PAGE 14 OF 15

GEOLOGIST(S): *Day*
 DATE: 8/18/89

PROJECT NO: *662-11*

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
	200.5 - 202	ND				55% SILT 45% SAND		201		weathered, mod friable, VFG-FG, mod sorted, sand in subangular - subround planes, traces of possible bedding SANDY SILTSTONE, light olive grey (5 Y 6/1), possibly horizontal laminae bedding, highly weathered, mod. poorly indurated, VFG-FG SAND, traces of calc & iron staining, trace of sand lenses, shells
	202.0 - 202.3	ND				55% SILT 45% SAND		202		Same as above
	202.3 - 204.3	ND						203		Same as above; bottom 6 in of interval was slacked - increase of sand content, possible concretion bedding and bioturbation
	204.3 - 206.3	(2) 1.85						205		Same as above; decreasing sand content at end of interval,
	206.3 - 208	(2) 1.75						207		Same as above.
	208 - 210	(2) 1.85		60°				208		CARBONACEOUS CLAYSTONE, massive bedding, highly weathered, mod friable, fracture @ 60°
								209		

Box 11 of 12

1
208

Box 12 of 12

olive grey (5 Y 4/1) and olive (5 Y 2/1)

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. 52-86

PAGE 1 OF 9

GEOLOGIST(S): UAF
 DATE: 8/11/59

PROJECT NO: 657-1122

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		
								72		
								73		
								74		
								75		
								76		
								77		
								78		
78.0	78.0							78	/ / / / /	Bainbridge J. Boxes
Box 1 of 5	to	.55 (1)				Clay 7508 Silt 2452		79	/ / / / /	Silty Claystone dk. yellowish orange to very pale orange. Mod. weathered. Mod. friable. Evidence of tilted layered bedding but core too broken to measure angle accurately. Trace carb. material.
	83.0									

NOTES: General USCS is modified for this log as follows:
 Material amounts are estimated by % volume instead of % weight.
 (1) Body 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. 52-86

PAGE 2 OF 9

GEOLOGIST(S): UAA

DATE: 8/16/89

PROJECT NO: 55-1122

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		See previous page for description of this interval.
								82		
	83.0							83		
Box 1 of 5	83.0									No Sample
								84		
								85		
								86		
								87		
								88		
	89.0							89		Silty Claystone. Very pale orange to dk. yellowish orange (10yr 8/2 to 6/6). Moderately weathered. Slightly to moderately friable. Block lenticular mineralization common. Possibly Mg-stained. Bedding not evident.
	89.0					Clay 50%				
	90.0	55 ⁽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. 52-86

PAGE 3 OF 9

GEOLOGIST(S): *WAF*

DATE: *5/11/53*

PROJECT NO: *117-20*

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 5	90.0	(2) 1.85				Clay 750% Silt 740%		91	/ / / / /	Silty claystone. Very pale orange (Dur s12) to dark yellowish orange (Dur b10). Bedding not evident. Moderately weathered, slight to mod. friable. Colchitic mineralization common, possibly Mg. Weathering (block) possible tilted bedding 30-40° from horiz.
	92.0	(1) 1.0				Clay 750% Silt 750%		92	/ / / / /	Same as above. Color change to very pale orange and grayish orange (Dur t4 to 8/2). Less silty at top of interval. Less blockiness weather (new trace).
	93.0	(1) .65				Clay 750%		93	/ / / / /	Same as above. Color very pale orange and dark orange (Dur s12 and b10). Less silty. Moderate mineralization.
	93.7	(1) .7				Clay 750%		94	/ / / / /	Same as above, fractures have some dark red dendritic mineralization (block) again.
	94.7	(1) .1			~70°	Clay 750%		94	/ / / / /	
	95.0	0						95	X X X X X	No Recovery
98.0	(1) .4			~60°		Clay 780%		98	- - - - -	Claystone: Very pale orange to dark brownish orange (Dur s12 to b10). Mod. weathered; mod. friable. Bedding not evident. Heavy mineralization (possibly Mg) as above) in fractures. Silt Trace silt.
99.0 99.0	(1) 1.55			40°		Clay 780%		99	/ / / / /	Claystone as above. Becoming silty toward bottom. Color change to pinkish gray (Dur s11), weathering indicates possible tilted bedding (40°).

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. 52-86

GEOLOGIST(S): LAJ
 DATE: 7/1/72

PROJECT NO: 617-1132

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
Bx 1 of 5 101.5	↑ 101.5							101		See previous page for description of this interval.
Bx 2 of 5 102.5		4.0				Sandy Silt		102		Sandstone, very lt. gray (NP). Mod. weathered. Non-friable. Bedding appears layered but not clear. Sand fine to med. grained, well sorted.
								103		
								104		
								105		
								106		
107.5								107		No Sample
								108		
108.5					40°	Clay 25% Silt 55%		109		Silty Claystone. Predominantly grayish brown. (10 yr. 7/4). Moderately weathered, slightly friable. Bedding appears tilted ~40°. Trace iron staining (may be from drilling process).

Begin
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. 52-86

GEOLOGIST(S): UAA

DATE: 8/16/79

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
	111.5							111	/ / / / /	See previous part for description of this interval.
	112.0	3(1)				Clay 2-5%		112	/ / / / /	Silty claystone. Gray to orange (10yr 7.5). Mod. weather. Slightly friable. From weathering, bedding appears tilted @ 50°.
	114.5	65(1)		40°	40°	Clay 2-5%		113	/ / / / /	Same as above. Color change to yellowish gray (5y 8/1) and dk. yellowish gray (10yr 6/6). Yellowish orange may be weathering. Fine carb. material.
	116.0	17(2)		60°	60°	Clay 2-5%		115	/ / / / /	Same as above. Tilted bedding.
	118.0	15(1)				Clay 2-5%		116	/ / / / /	Same as above. Bedding not evident and weathered moderately friable.
	120.0	19(1)	UAA #7		30°	Sand 70%		117	/ / / / /	
	120.0							118	/ / / / /	
	120.0							119	/ / / / /	Sandstone. Very fine to grayish orange (10yr 7.5 to 7H). Slightly to mod. weathered. Slightly friable. Layered bedding tilted to 2-50° w. of sand. Some clay. Trace black 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. 52-86

PAGE 6 OF 9

GEOLOGIST(S): UAF
 DATE: 8/11/57

PROJECT NO: 57-122

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 5	120				6°		SAND (S)	121	|	Sandstone very pale orange to grayish orange (Durs 2 to 7 1/2). Moderately weathered. Friable. Layered bedding. Some vfg sand. Some silt. Trace clay.
	123.0	9(1)						122	|	
	124.0	7(0)		27°	50°		SILT (S)	123	|	
Box 3 of 5	124.0						SILT (S)	124	|	Siltstone, very pale orange to grayish orange (Durs 2 to 7 1/2). Mod. weathered. Slightly friable. Layered bedding. Tuff to 50. Have one healed fracture at 27° (opposite bedding angle). Some iron staining & block mineralization. Some vfg sand.
	126.0	1.7(2)		6°	60°		SILT (S)	125	|	
	127.0	1.5(2)			50°		SILT (S)	126	|	Same as above.
	128.0						SILT (S)	127	|	Same as above.
	128.0	2.6(3)			50°		SILT (S)	128	|	Same as above. Begins grading to siltstone Olive gray (5y 4/1). Layered with the above siltstone through this interval.
	↓						SILT (S)	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.

PAGE 8 OF 9

GEOLOGIST(S): LAA

DATE: 8/16/87

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
	↑								[Lithologic Log Symbols]	See previous page for description of this interval.
141						Silt 25%		141	[Lithologic Log Symbols]	Siltstone w/v.f.g. sandstone layers. Olive gray (5y4/1) and very lt. gray (N8) mod. weathered, slightly friable. Bedding in layers. Not as distinct as upper intervals. Some soft sed. deformation. Trace carb. material.
		1.5(1)				Sand 50%		142	[Lithologic Log Symbols]	
143								143	[Lithologic Log Symbols]	Same as above. Less v.f.g. sand. Some discoloration in matrix. Grayish orange (10y7/4).
		1.75(1)		280°		"		144	[Lithologic Log Symbols]	
144.5									[Lithologic Log Symbols]	Siltstone. Olive gray (5y4/1). Slightly weathered. Slightly friable. Bedding not evident. Trace carb. material. Some v.f.g. sand.
145.0		.5(1)				Silt 75%		145	[Lithologic Log Symbols]	
									[Lithologic Log Symbols]	Same as above.
146.5		1.4		270°		Silt 75%		146	[Lithologic Log Symbols]	
									[Lithologic Log Symbols]	Same as above.
147.5		.8				Silt 75%		147	[Lithologic Log Symbols]	
									[Lithologic Log Symbols]	Same as above.
149.0								148	[Lithologic Log Symbols]	
150.0		.8				Silt 75%		149	[Lithologic Log Symbols]	Same as above. Bedding not evident. Some dk. yellowish brown discoloration (10y7/6)

Box 4 of 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.

2
5
↓



ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 52-86

PAGE 9 OF 9

GEOLOGIST(S): LAA

DATE: 8/11/89

PROJECT NO: 75-10-10

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 5	150.0	152.0				Silt >50%		151	---	Siltstone. Olive gray (5y 4/1). Slightly weathered. Slightly friable. Some v.f.g. sand. Trace carb. material. Bedding not evident.
			1.9			Silt >50%		152	---	
								153	---	
	154.0	154.0						154	---	Bottom of Boxes
								155	---	
								156	---	

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. 54-86

PAGE 1 OF 4

GEOLOGIST(S): D C B

DATE: 2/28/89

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
										Interval begins at 50.6 ft.
50.6	50.6					250 μ clay		51	---	Claystone, light gray (N7), bed is not apparent weathered, slightly friable, iron stains occur locally and on partings.
								52	---	
								53	---	
								54	---	
								55	---	
	55.6									
	55.6							56	---	Color grades grayish orange (10 YR 7/4) at ~ 56 ft
								57	---	Highly weathered zone at ~ 57.5 ft dark yellowish brown (10 YR 5/4) with small light colored x-tallic deposits.
								58	---	
								59	---	Strike-sides at ~ 59 ft, attitude ~ 80°
59.5	59.5									
59.5	59.5									
59.5	60.6									

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. 54-876

PAGE 2 OF 4

GEOLOGIST(S): OCB

DATE: 8/23/87

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
	59.5 to 60.6	ND				250% clay				Claystone, mottled grayish orange (10 YR 7/4) to light gray (N7), bedding not apparent, weathered slightly friable iron staining locally and on parting = OCB slight silt parting. slickensides at 60.2 ft., attitude ~70°.
	60.6 to 65.6	ND						61 62		
	65.6 to 65.6	ND						63		small ^{OCB} barren bodies of ^{OCB} calcareous mineralization at ~62.5 ft.
	65.6 to 68.7	ND						64 65		Increase in silt parting from ~64 ft. to ~65.8 ft. Two ferric concretions at ~65.6 ft. ~4.5 cm. diam.
	68.7 to 70.6	ND						66 67 68 69		
	70.6 to 70.6	ND								Claystone med. light gray (N6), bedding not apparent (massive?), slightly 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.

LOG OF BORING NO. 54-86

PAGE 3 OF 4

GEOLOGIST(S): DCB

DATE: 8/28/89

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
	68.7 to 70.6	ND				75% clay				(cont'd. from previous) occasional iron stains, slight silt fraction.
	70.6 to					75% clay		71		silty sandstone, light gray (U7), thin bedded (where apparent), slightly friable, moderate sand fraction, iron staining on fractures and some strata.
		ND				75% clay		72		
						75% clay		73		Claystone, light gray (U7), bedding not apparent, slightly friable, moderate silt fraction, occasional iron staining.
	73.8 to 73.8					75% clay		74		
		ND				75% clay		75		Sandy siltstone, light gray (U7), bedding not apparent, slightly friable, moderate sand fraction, local iron staining.
	75.6 to 75.6							76		silty claystone, light gray (U7), bedding not apparent, slightly friable, occasional iron staining.
	76.7 to 76.7	.5						77		Claystone, light gray (U7), bedding not apparent, slightly friable, iron staining locally and on partings, slight silt fraction.
	77.6 to 77.6	ND		15°		75% silt		78		
	77.9 to					75% silt		79		siltstone, light gray (U7), bedding is faint but appears to be thin (< 2mm) and horizontal, slightly friable, slight silt component as interbedding beds.
	80.6									Sandy siltstone, light gray (U7), thin bedded (< 2mm), roughly horizontal with soft sediment deformation.

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. 54-86

PAGE 4 OF 4

GEOLOGIST(S): DCB

DATE: 8/28/89

PROJECT NO: C67-11-22

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
	77.6 to 80.6	ND				~50% silt		81	---	(cont'd. from previous page), slightly friable, v. sand occurs as individual strata, occasional iron stain and carb. mineralization
	80.6 to					~50% v. silt		82	---	
		ND						83	---	
	84.6 to					~50% silt		84	---	Clayey siltstone, light gray (N7) thin bedded (< 2mm) slightly friable, occasional iron staining.
	84.6 to							85	---	
		ND						86	---	Claystone, light gray (N7), bedding not apparent to thin (< 2mm) where observable, slightly friable, slight to moderate silt fraction, local iron staining.
	87.4 to							87	---	
	87.4 to							88	---	
		.65						89	---	
	89.6 to								---	Bottom of Box 5 at 89.6 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. 57-86

PAGE 1 OF 2

GEOLOGIST(S): LAF

DATE: 3/15/39

PROJECT NO: 57-86

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	/	No Sample
								2	/	
								3	/	
								4	/	
								5	/	
	6.0							6	/	
Box 1 of 1								7	/	See Next page Silty Clay Dk. yellowish orange (10% to 16%) and yellowish gray (mostly) some v.f.g. ^{to v.c.g.} sand and gravel toward top of interval.
	9.0							8	/	See next page for description
	2.0							9	/	
	to 12.0								/	

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. 58-86

PAGE | OF |

GEOLOGIST(S): UAA

DATE: 8/11/89

PROJECT NO: 617-027

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 ↓	0.9	.6 (1)				Clay >50%	CL	1	X	Silty Clay, med. brown (5yr 3/4). Est. plast. Low. Some gravel + sand. Sand v.f.g. to granules. Gravel granules to 3.5cm. Subangular to rounded. Gravel + silt sized root material
	2.0	0						2	X	No Sample
	2.8	1.1 (1)				Sand 35% Gravel 15%	GC	3	O	Clayey sand + gravel. Dk. yellowish brown (10yr 4/2). Sand v.f.g. to angular subangular to rounded. Well graded. Gravel granules to 6cm. angular to sub. rounded, well graded. Trace Gravel + root material.
	3.1	.4 (1)				Clay >50%	CL	4	O	Clay and silty sandy clay, intermixed. (Bedding not evident.) Lt. brownish gray to dk. yellowish orange. Est. plast. of clay areas - med. to high - Est. plast. of silty clay areas - med. sub. Very crumbly.
Box top	7.0	1.7 (1) 4/4				Clay >50%	CL	5	O	Same as above grading to claystone. Pale yellowish brown. (5yr 6/2) - highly weathered. Slightly to med. friable. Trace carb. material. Some iron staining.
	8.0	1.7 (1)				Clay >50%	CL	8	O	Same as above claystone. med. to highly friable.
9.0 ↑	9.0							9		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.

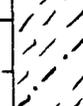
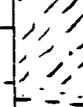
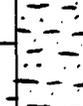
LOG OF BORING NO. 58-86

PAGE 1 OF 1

GEOLOGIST(S): VAA

DATE: 3/14/89

PROJECT NO: 37-1122

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	0.4 ⁽¹⁾				Clay >50%	CL			Silty Clay. Dk. yellowish brown (10yr 4/2). Est. plast. low to med. Some sand. v.f.g. to coarse. Some gravel. Gravel to 4cm subrounded. Some surface root material.
	0.8							1		No Sample
	3.0							2		
	4.0	0.1 ⁽¹⁾				Clay >50%	CL	3		Clay lt. olive gray (5y 6/1) to grayish orange (10y 7/2). Est. plast. med. Some silt. Sample very small. Difficult to describe.
	4.5	0.6 ⁽¹⁾				Clay >50%	CL	4		Silty clay. Yellowish gray (5y 5/1) Est. plast. moderate. Trace calc. carbonate.
								5		Same as above. Some iron staining.
		1.9 ⁽¹⁾				Clay >50%	CL	6		
	7.5							7		
		2.2 ⁽¹⁾				Clay >50%	CL	8		Sandy Clay. Pale yellowish brown (10y 5/2). Est. plast. low to med. Sand v.f.g. to silt sized. Some carb. material. Some iron staining.
								9		
10.0	10.0									

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.

Bottom of Boxes.¹



ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 59-86

PAGE 1 OF 4

GEOLOGIST(S): LAA

DATE: 2/13/89

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	5 ⁽¹⁾				Clay 75%	CL		/ / / / /	Silty Clay. Dk. yellowish brown (10yr 4/2) to dk. yellowish orange (10yr 6/6). Some grass + root material.
	0.5							1	/ / / / /	Silty Clay. Dark yellowish brown (10yr 4/2) to dark yellowish orange (10yr 6/6). Some v.f.g. sand. Trace gravel (small). Est. plast. Mod. to high.
	2.0	1.1 ⁽¹⁾				Clay 76%	CL	2	/ / / / /	
								3	- - - - -	Sandy Clay. Pale yellowish brown (10yr 6/2). Est. plasticity moderate. Sand v.f.g. Some silt. Trace root material. Est. plast. to high.
		(1) 1.7				Clay 75%	CL	4	- - - - -	
	5.0							5	- - - - -	
		(1) .4				Clay 75%	CL	6	- - - - -	Same as above. Some lt. brown (5yr 7/0) coloring. Matrix milky calcareous.
	7.5							7	- - - - -	
		(1) 2.1				Clay 75%	CL	8	- - - - -	Same as above. Color change greenish orange to dk. yellowish orange (10yr 7/4 to 6/6). Calcite stringers.
								9	- - - - -	
	10.0								- - - - -	

Box 1 of 3

NOTES: General USCS is modified for this log as follows:
 Material amounts are estimated by % volume instead of % weight.
 (1) Body 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. 59-86

PAGE 2³ OF 4
LA

GEOLOGIST(S): UAA

DATE: 8/18/89

PROJECT NO: 107-122

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 3	20.0					Sand 75%	S ₁ M ₄	-21-	[Symbol: Dotted pattern]	Sandstone, yellowish gray (5y 3/1). Mod. to highly weathered. Mod. to highly friable. Bedding not evident. Some iron staining. Trace carbonaceous material. Some silt sand v.f.g.
	22.5	(1) 2.5	CHH #9					-22-		
	25.0					Silt 75%		-23-	[Symbol: Horizontal dashes]	Clayey Siltstone. Pinkishgray (5y 3/1) to dk. yellowish orange (10y 6/6). Highly weathered. Mod. friable. Bedding not evident. Some iron staining. Some calc. c.
25.0	1.9				-24-					
Box 30 of 3	25.0					Sand 75%		-25-	[Symbol: Dotted pattern]	Sandstone, yellowish gray (5y 3/1). Mod. weathered. Mod. to highly friable. Bedding not evident. Some silt. Mildly carbonaceous.
	26.5	(1) .35						-26-		
	27.5	(1) .40				Clay 75%		-27-	[Symbol: Diagonal dashes]	Silty Claystone. Grayish orange to moderate yellowish brown (10y 5/4) to (10y 7/4). Highly weathered. Mod. friable. Some iron staining.
	29.0	(1) .9						-28-		
	30.0					Clay 75%		-29-	[Symbol: Diagonal dashes]	Same as above grading to claystone lt. brownish gray (5y 6/1). Highly weathered mod. friable. Bedding not evident. Some iron staining. Some silt. Trace carb. material.
					-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. 59-86

PAGE 34 OF 34
UA

GEOLOGIST(S): UFA

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 3 of 3	30.0	(1) 1.3				clay > 50%		31 32		Claystone. Lt. brownish gray (5yr 4.1). Highly weathered. mod. friable. Bedding not evident. Some silt. Some iron staining. Trace carb. material.
32.5	32.5							33		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. 60-86

PAGE 1 OF 4

GEOLOGIST(S): GAA

DATE: 3/21/89

PROJECT NO: 607-102

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE IN INTERVAL	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
0.0	0.0	5 ⁽²⁾				CLAY 750%	CL		/ / / / /	SILTY-CLAY, grayish brown (5 YR 3/2). EST. PLAST. LOW-MOD. SOME GRAVEL, GRAVELS TO 2 CM. SOME SURFICIAL GRASS, SOME ROOT MATERIAL. TRACE SAND V.F.G. TO V.C.G.
	0.5							1	- - - - -	
						CLAY 740%		2	- - - - -	SILTY SANDY, CLAY. grayish brown (5 YR 3/2). EST. PLAST. low-MOD. SAND V.F.G. TO U.C.G. MOD. WELL GRADED. SOME GRAVEL GRAVELS TO 2 CM. SOME ROOTS TOWARDS TOP
		3.6 ⁽¹⁾				SAND 720%	CL	3	- - - - -	COLOR etc. CHANGE AT APPROX. MIDDLE OF INTERVAL TO MOD. YELLOWISH BROWN (10 YR 5/4). LESS GRAVEL. some calcitic.
								4	- - - - -	
	5.0					SILT AND SAND 730%	CL	5	- - - - -	SANDY CLAY. grayish-orange (10 YR 7/4). EST. PLAST. LOW-MOD. V.F.G. SAND. WELL SORTED. SOME CARB. MATERIAL. TRACE GRAVEL AT BOTTOM.
		2.5 ⁽²⁾				CLAY 740%		6	- - - - -	
								7	- - - - -	
	7.7					CLAY 750%	CL	8	- - - - -	SANDY GRAVELLY CLAY. grayish-orange (10 YR 7/4) to yellowish gray (5 Y 8/1). EST. PLAST. LOW-MOD SAND V.F.G. TO U.C.G. GRAVEL GRAVELS TO 2 CM.
	8.7	85 ⁽¹⁾				CLAY 770%	CL	9	- - - - -	CLAY, grayish-orange (10 YR 7/4) to yellowish gray (5 Y 8/1) some ^{MF} AND SOME DARK YELLOWISH ORANGE (10 YR 6/6). EST PLAST MOD. SOME SAND, TRACE SILT, TRACE GRAVEL AND TRACE CARB. MATERIAL
10.2	10.2	1.6 ⁽¹⁾							- - - - -	

Box 1 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. 60-86

PAGE 2 OF 4

GEOLOGIST(S): CAA
 DATE: 8/2/39

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
10.2	10.2								/ / / / /	SILTY CLAY, yellowish gray (5Y 8/1) to dark yellowish orange (10YR 6/4) EST. PLAST. MOD. TRACE IRON STAINING
		1.7 ⁽¹⁾				CLAY >50%	CL	11	/ / / / /	
	12.7							12	/ / / / /	SAME AS ABOVE
	13.4	.5 ⁽¹⁾						13	/ / / / /	
		1.35 ⁽¹⁾				CLAY >50%		14	- - - - -	CLAYSTONE, lt. olive gray (5Y 6/1), highly weathered, MOD. FRIABLE bedding NOT EVIDENT. SOME IRON STAINING. SOME CaCO ₃ IN AREAS.
	15.2							15	- - - - -	SAME AS ABOVE
		1.9 ⁽¹⁾				CLAY >50%		16	- - - - -	
	17.7							17	- - - - -	SAME AS ABOVE, SOME SILT. highly FRIABLE. LESS CaCO ₃ .
	18.9	1.0 ⁽¹⁾				CLAY >50%		18	- - - - -	
	20.2	1.4 ⁽¹⁾				SILT >50%		19	- - - - -	SILT CLAYSTONE . CLAY SILTSTONE. yellowish gray (5Y 8/1) to dark yellowish orange (10YR 6/4) highly weathered, MOD. FRIABLE. SOME IRON STAINING.

Box 2 of 4

Begin new log

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. 60-86

PAGE 3 OF 4

GEOLOGIST(S): LAA
 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
	20.7	1.00				Silt 5.4 5.8			[Lithologic Log Symbol]	CLAYEY SILTSTONE. yellowish gray (5Y 2/1) to dark yellowish orange (10YR 6/4) highly weathered. MOD. FRIABLE. SOME IRON-STAINING.
20.7						Silt 5.4 5.8		21	[Lithologic Log Symbol]	SILTSTONE. yellowish-gray (5Y 8/1), highly weathered, MOD. FRIABLE. bedding NOT EVIDENT. SOME CaCO ₃ . TRACE CARB. MATERIAL
	22.7	1.80				Silt 5.4 5.8		22	[Lithologic Log Symbol]	
						Silt 5.4 5.8		23	[Lithologic Log Symbol]	SAME AS ABOVE; with trace iron staining.
	25.2	2.60				Silt 5.4 5.8		24	[Lithologic Log Symbol]	
						Silt 5.4 5.8		25	[Lithologic Log Symbol]	SAME AS ABOVE, SOME CLAY
	27.7	3.80				Silt 5.4 5.8		26	[Lithologic Log Symbol]	
						Silt 5.4 5.8		27	[Lithologic Log Symbol]	
	30.2	1.90				Clay 5.4 5.8		28	[Lithologic Log Symbol]	SILTY CLAYSTONE; Lt. olive gray (5Y 6/1) to dark yellowish orange (10YR 6/4) highly to mod weathered. MOD. FRIABLE. bedding NOT EVIDENT. SOME IRON STAINING in fractures. SOME CARB. MATERIAL. TRACE CaCO ₃ .
	30.2 ↓							29	[Lithologic Log Symbol]	

begin next list →

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. 60-86

PAGE 4 OF 4

GEOLOGIST(S): LAA

DATE: 8/21/86

PROJECT NO: 667-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE OF INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
30.2	30.2									
	31.2	100)				Clay 50%		31	/ / / / /	SILTY CLAY STONE, PALE YELLOWISH BROWN (10YR 6/2) MOD-highly weathered. MOD. FRIABLE. bedding NOT EVIDENT. heavy iron staining in fractures. SOME CARB. material in fractures. TRACE CaCO ₃ .
	32.7	70)				Clay 75%		32	/ / / / /	SAME AS ABOVE WITH COLOR CHANGE TO LIGHT BROWNISH GRAY (5YR 6/1.)
	35.2	2.50)		90°		Clay 50%		33	/ / / / /	SAME AS ABOVE, BECOMES VERY SILTY TOWARD BOTTOM
	37.7	2.50)		90°		Clay 50%		34	/ / / / /	
								35	/ / / / /	SAME AS ABOVE
								36	/ / / / /	
								37	/ / / / /	
								38	/ / / / /	
								39	/ / / / /	

Box 4 of 4

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. 61-86

GEOLOGIST(S): UAA

DATE:

8/15/79

PROJECT NO: 61-86

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					Sand 50% Gravel 50%	GW	0.0 0.0 0.0 0.0 1.0 2.0 2.5		Sand + gravel. Pale yellowish brown (10yr 6/2) to Lt. olive gray (5y 6/1). Sand v.f.g. to granules well graded subangular to sub-rounded. Gravel angular to subangular. Max. size ~ 2cm. Some silt. Some asphalt. Caliche. Some grass + roots @ surface. Becomes gravelly Caliche toward bottom. Gravel ^{larger} to 6cm.
		2.5	(1) 1.9			Caliche 50% Clay 50%	CL	3.0 4.0		Caliche white (N9) and sandy clay yellowish gray (5y 8/1). Plasticity (est.) low to med. Sand med graded to v.c.g. Some iron staining.
		5.0	(1) 2.1			Sand >50%	SC	5.0 6.0 7.0 8.0		Clayey sand yellowish gray (5y 8/1) to olive gray (5y 4/1) to dk. yellowish orange (10y 6/6). Sand f.g. to v.c.g. Sub. angular to rounded. Mod. well sorted. Some gravel. To 2cm sub rounded. Traces of asphalt. Some areas caliche.
		8.5		UAA #6		Gravel 75% Clay >25%	GC	9.0		Sandy Clayey Gravel. No predom. gravel color. Angular to sub rounded. Mod. to well sorted. Max size 5.5cm. Sand fi. to c. graded. Clay dk. yellowish orange 10yr 6/6.
		11.5	(1) 1.4							

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.



LOG OF BORING NO. 61-86A

PAGE 1 OF 4

GEOLOGIST(S): OAT
 DATE: 8/18/89

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
00 ↓	1.0	1.00					GC	1	-0- -0- 00-	MATRIX COLOR CLAY GRAVEL, dk yellowish brown (10 YR 4/2). Angular to subangular. Mod to well graded. Max size = 4.5 cm. Some sand. Trace of calcite.
	1.0 - 3.0	0						2	X	NO SAMPLE
	3.0 - 4.5	0						3	X	NO SAMPLE
	4.5 - 8.0	1.90						4	X	NO SAMPLE
Box 1 of 2	8.0 - 13.0	2.50				100% CLAY	CL	5	|	Top 1 Ft. CALICHE. Blueish white (5 B 9/1) TRACE OF CLAY
						100% CLAY	CL	6	|	
						100% CLAY	CL	7	|	Bottom 1 Ft. CLAY. Very lt. gray (5 Y 6/1). Mod-high plast. Some iron staining as mottles. Trace of calcite
						100% CLAY	CL	8	|	SAME AS ABOVE, lt olive gray (5 Y 6/1) ABUNDANT CALCITE IN BOTTOM 30 INCHES OF INTERVAL
								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. 61-86A

PAGE 2 OF 4

GEOLOGIST(S): DAT
 DATE: 9/18/29

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
	8.0 - 13.0							11	---	SEE PREVIOUS PAGE
		2.5(1)						12	---	
	13.0							13	---	SAME AS ABOVE CLAY, Lt. olive gray (5 Y 6/1). MOD-HIGH PLAST. IRON STAINING AS MOTTLES; TRACE OF CALCITE
	13.0 - 15.5					100% CLAY	CL	14	---	
		1.9(1) 3.7						15	---	SAME AS ABOVE; TRACE OF CARB. MATERIAL
	15.5							16	---	
	15.5 - 18.0					100% CLAY	CL	17	---	
		1.8(1)						18	---	SAME AS ABOVE; IRON STAINING IN FRACTURES. TRACE OF SILT
	18.0							19	---	
	18.0 - 19.0					100% CLAY	CL		---	SAME AS ABOVE; Grayish yellow (5 Y 8/4) TRACE OF VERY FINE GRAIN SAND;
	19.0 - 20.5					100% CLAY	CL		---	
		.9(1) 1.8(1)								

Box 1 of 2
 →
 Box 2 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. 61-26A

PAGE 3 OF 4

GEOLOGIST(S): DAT
 DATE: 8/13/61

PROJECT NO: 667-11 ZE

TOP/SECTION OF CORE IN BOX	TOP/SECTION 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	19.0-20.5							x	---	SEE PREVIOUS PAGE	
	20.5-22.0	1.0(1)				100% CLAY	CL	21	---	CLAY; yellowish gray (5Y 8/1); MOD-HIGH PLAST. SOME SILT; SOME IRON STAINING; SOME Mg STAINING; FLOUARY texture.	
	22.0-23.0	1.25(1)				100% CLAY	CL	22	---	CLAY; med. Lt. brownish gray (5YR 6/1) MOD PLAST.; TRACE OF SILT; TRACE OF IRON-STAINING AS MOTTLES	
	23.0-25.5	1.2(1)				100% CLAY	CL	23	---	SAME AS ABOVE	
	25.5-28.0	1.45(1)				100% CLAY	CL	24	---	SAME AS ABOVE; TRACE OF CARB MATERIAL	
	28.0-30.5	1.6(1)		0°		100% CLAY	CL	25	---	Top of INTERVAL: grayish orange (10YR 7/4). Bottom of INTERVAL: SAME AS ABOVE; Lt. olive gray (5Y 6/1). FLOUARY texture	
								26	---		
								27	---		
							28	---			
							29	---		SAME AS ABOVE; SOME IRON STAINING AS MOTTLES AND ALONG HORIZONTAL FRACTURES	

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. 61-86A

PAGE 4 OF 4

GEOLOGIST(S): DAF

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 2052 30.5↑	28.0-30.5 30.5					100% clay			---	SEE PREVIOUS PAGE
End of boxes								31		

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. 62-86

PAGE 1 OF 6

GEOLOGIST(S): *dy*
 DATE: 8/15/84

PROJECT NO: 62-11-27

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 - 0.5	(1) 0.3					CL			GRANULY SAND ^{duster yellowish brown (10 YR 2/2)} sub angular, subrounded, max gravel size = 3mm, some silt, some clay
	0.5 - 4.0	(1) 3.5				CLAY = 60% SAND = 30% Gravel = 10%	CL	1		Sandy clay, dark yellowish brown (10 YR 4/2), med plast, some gravel (max size = 3mm), sand is fq-mg, trace of roots
				70° - 80°				2		Bottom of interval: same as above, greenish orange (10 YR 7/4), increased amount of sand, some silt, trace of roots, some calc. material in possible fractures
						CLAY = 55% SAND = 40% Gravel = 5%		3		
								4		
	4.8 - 7.5	(1) 1.4				CLAY = 55% SAND = 40% Gravel = 5%	CL	5		Same as above: calc material in fractures is more abundant.
								6		
								7		as matter
	7.5 - 10.3	(1) 2.2				CLAY = 52% SAND = 48%	CL	8		Same as above: trace of calc. material no apparent fractures, sand fraction is larger, trace of gravel
								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. 62-36

PAGE 2 OF 6

GEOLOGIST(S): *DAJ*

DATE: *3/15/69*

PROJECT NO: *62-36*

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
<i>Box 1 of 6?</i>	10.3 -17.0					48% SAND 5% CLAY	CL	11		See previous page Sandy clay, dark yellowish brown (10 YR 4/2) mod. plast. some silt, sand is Fg-mg,
	12.8 -12.8							12		
<i>Box 2 of 6?</i>	12.8 -14.0	(1) 0.5				20% GRAVEL 70% SAND	GM	13		light brown (5 YR 5/6) GRAVELLY SAND, dark yellowish brown (10 YR 5/5) angular-subangular, mod-well graded, max silt/gravel = 7 cm, some silt.
	14.0 -14.5	ND					CL	14		CLAY, greyish orange (10 YR 7/4), mod. plast. Some iron staining as mottles, some silt, trace of gravel
	14.5 -15.3	(1) 1.5				10% GRAVEL 55% SAND 5% CLAY	CL	15		GRAVELLY SANDY CLAY, moderate yellowish brown (10 YR 5/4), mod-high plast. max gravel smp = 2 cm, sand is Fg-Cg some silt possible, Mg staining and concretions.
	15.3 -17.8	(1) 1.0					CL	16		Same as above
	17.8 -20.3	(1) 1.0				55% SAND 35% GRAVEL 10% CLAY	SC	18		CLAYEY GRAVELLY SAND, moderate yellowish brown (10 YR 5/4), subangular-subrounded, mod-well graded, max gravel smp = 5 cm, of possible Mg staining & mottled concretions. Sand is MG-CG, trace of iron staining as mottles.
								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. 62-86

PAGE 3 OF 6

GEOLOGIST(S): *DAY*
 DATE: *8/15/87*

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?	20.3 -22.0	(1) 1.0				20% CLAY 60% SAND (40% MS) 20% GRAVEL	SC	21		See previous log CLAYEY GRAVEL SAND, moderate yellowish brown (10 YR 5/4), sub angular - sub rounded, mod. well graded, max gravel size 7 mm. Sand is MG-VG, trace of possible Mg staining & concretions
	22.0 -22.5	(1) 0.5					CL	22		Clay, greyish orange (10 YR 7/4) - est. mod. plast, some iron staining as mottled, some gravel, trace of possible gypsum.
	22.8 -25.3	ND					CL	23		Same as above; 1 mm - 2 cm VFG-FG sand lenses (with light grey (NS)), trace of iron concretions at bottom of interval.
	25.3 -24.0	(1) 1.2				60% FS 20% VFG 20% SILT	SM	24		VFG-FG and light grey (NS) SILTY SAND, pale yellowish orange (10 YR 8/6), sub angular - sub rounded, poorly graded, abundant iron staining, trace of possible staining,
	27.0 -27.8	ND				same as above	SM	27		SAME AS ABOVE; INCREASED COMPACTENCY; SOME CLAY
	27.8 -30.3	(1) 2.3					SM	28		SAME AS ABOVE
Box 3 of 6?	27.0 -27.8	ND				same as above	SM	27		SAME AS ABOVE
	27.8 -30.3	(1) 2.3					SM	28		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. 62-86

GEOLOGIST(S): *WCS*
 DATE: *8/15/87*

PROJECT NO: *62-86-1122*

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 6										
30.3	-32.8							31		CLAYEY SANDSTONE, pale yellowish orange (10 YR 5/6) and light gray (N8), gradational contact between sand and rock, subangular - subrounded, poorly highly weathered, uncol frustule, VFG - FS, well sorted, non staining so weathered
32.8	-34.5	(1)						33		Top 3in - Same as above Bottom of interval NEXT 6in: SILTSTONE, light olive gray (5 Y 6/1), sharp contact with mudstone above, highly weathered, poorly sorted, subangular to subrounded, pale yellow orange (10 YR 8/6) and light gray (N8), non-apparent bedding (flowing texture), highly weathered, well sorted, uncol frustule, staining from staining 3-4 in above; Nq staining shows distinctive pattern
34.5	-35.3	(1)						35		CLAYEY SILTSTONE, light olive gray (5 Y 6/1), massive bedded, highly weathered, well - possibly friable, cementation weak, staining from staining
35.3	-36.0							36		Thin interbedding of: 1. Fine grained sandstone, very pale orange (10 YR 8/2), highly weathered, weak friable, well bedded 2. Silty sandstone, weak, light gray (N8), well weathered, uncol frustule, staining from staining through out - so weathered & staining bands of staining
36.0	-37.0							37		Same as above: base of red material
37.8	-40.3	(1)						38		
								39		
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. 62-86

PAGE 5 OF 6

GEOLOGIST(S): *Day*
 DATE: 8/15/82

PROJECT NO: 663-1122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE OF INTERVAL IN BOX	SAMPLE NUMBER	FRACTURE ANGLE	BEDDING ANGLE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN FEET	LITHOLOGIC LOG	LITHOLOGIC DESCRIPTION
Box 4 of 6	40.3 -42.8	(1) 1.8	117					41		See previous page SILTY SANDSTONE, yellowish grey (5 Y 8/1), gradational contact, highly weathered, mod friable, VFG-FG, mod mod-well sorted, abundant iron staining as mottles & carb. material, some interbedding of clayey SILTSTONES (<1mm), SOME CLAY
	42.8 -45.3	(1) 2.8				SANDSTONE 70% VFG-FG 30% SILT CLAY (10% CLAY)		43		Same as above
								44		SLABBED CORE shows interbedding of sandstone & claystone claystone claystones, light olive grey (5 Y 6/1)
								45		Same as above
Box 5 of 6	45.3 -47.8	ND						46		
								47		
	47.8 -50.0	(1) 2.5		35°				48		SILTY CLAYSTONS, light olive grey (5 Y 4/1) non-apparent bedding, well weathered, mod friability, some iron staining as mottles, fracture @ 35°
								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. 62-86

PAGE 6 OF 6

GEOLOGIST(S): *WAS*
 DATE: 8/13/37

PROJECT NO: *157-1123*

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
Box 5 of 6	50.0 - 50.3	0.3							S	<p>Silty sandstone, very fine orange (10 VR 5/2) Well weathered, mod - low friability VFG-FG, well-mod sorted. See also thin Same as above: Slat shows - wavy bedding micro slump structures, soft sediment deformation, possible burrows</p>
	50.3 - 52.8	(1) 2.1						-51-	S	
	52.8 - 54.0	(1) 0.9						-52-	S	
	54.0							-53-	S	
Box 6 of 6	54.0 - 55.3	(1) 1.7						-54-	S	<p>Same as above: FG-MG, trace of carb material greyish orange (10 VR 8/2) Same as above: mod-high friability, trace of clay Same as above: Some clay</p>
	55.3 - 57.8	(1) 1.8						-55-	S	
	57.8 - 59.3	(1) 1.4						-56-	S	
								-57-	S	
								-58-	S	
END OF BOXES								-59-	S	<p>Same as above: increased clay content in bottom 4" of interval</p>

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. 63-86

PAGE 1 OF 2

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

PROJECT NO: 17-122

TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE 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	0.5	0.5				Clay 75%	CL	0	0	Gravelly silty clay. Dusky yellowish brown (10yr 2.5). Est. plast. moderate. Gravel angular to subrounded. Fine to 2 cm. Some sand. Some surficial root material.
						Clay 75%	CL	1	1	Sandy clay. Mod. yellowish brown (10yr 5.5). Est. plast. mod. to high. Sand v.f.g. to med. gravel. Some gravel ≈ 1cm.
			2.5					2	2	
								3	3	
		3.8						4	4	Gravelly clay - top 5 in. Mod. yellowish brown (10yr 5.5). Est. moderate. Gravel angular to sub rounded. Some to 4.5 cm. Some silt. Grades to silty clay. Moderate yellowish brown (10yr 5.5). Est. plast. mod. to high. Some sand. v.f.g.
			1.3			Clay 75%	CL	5	5	
		5.8						6	6	Silty clay LA Same as above. Trace root material LA Sandy clay. Mod. yellowish brown (10yr 5.5). Est. plast. moderate. Sand v.f.g. to f.g. well sorted. Trace root material.
			2.4			Clay 75%	CL	7	7	
		7.3						8	8	Same as above.
		1.1			Clay 75%	CL	9	9		
	9.8							9.8		

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. 63-86

PAGE 2 OF 2

GEOLOGIST(S): GA
 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 2	9.8					Clay silt	CL	11	---	Sandy clay. Moderate yellowish orange (10yr 5/6) Est. plast. moderate sand v.f.g. to f.g. well sorted. Trace carb. material toward bottom of interval.
	12.3	1.9			12			---		
	Box 2 of 2	14.3				Clay silt	CL	13	---	Same as above. Trace fine gravel. to ≈ 1 cm.
		14.8	1.4					14	---	
Box 2 of 2	14.8	.6			Clay silt	CL	15	---	Sandy gravelly clay. Very pale orange (10yr 5/6) Lt. brown (5yr 6/6) to dark yellowish orange (10yr 6/6) Est. plast. moderate. Gravel angular to sub rounded. Mod. well graded. To 6 cm. sand v.f.g. to coarse Clay. Very pale orange to dk. yellowish orange 10yr 5/6 to 6/6. Est. plast. mod. to high. Some silt. Trace sand. CaCO ₃ in stringers and throughout matrix.	
	17.3	2.65					16	---		
	17.3						17	---		
								18	---	Bottom of Boxes
								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. 16-86

PAGE 1 OF 2

GEOLOGIST(S): WPA
DATE: 5/17/89

PROJECT NO: 167 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					Gravel > 50%	GC	1	0-1.0	Silty clayey gravel. No predom. color. gravel subangular to subrounded. Mod. graded. Max. size 7cm. Silty clay matrix grayish brown (5yr 3/2) some sand. some surficial grass & root material.
	2.0					Gravel 50%	GC	2	0-2.0	Silty clayey gravel as above
	3.0					Gravel > 90%	GW	3	0-3.0	Gravel. No predom. color. Angular to sub rounded mod graded (1-7 cm). Trace silty clay.
	3.3					Gravel > 40%	GC	4	0-3.3	Silty clayey gravel. No predom. gravel color angular to sub angular. Mod well graded granules to 3.5 cm. Silty clay matrix brownish brown (5yr 3/2). Some sand. Trace root material.
	4.0					Gravel > 40%	GC	5	0-4.0	Silty clayey gravel. No predom color. Angular to sub angular. Mod. graded granules to 2cm. matrix grayish orange silty sandy clay (some sand). Some roots @ bottom
	6.0					Clay 50%	CC	7	0-6.0	Clay. Dk. grayish orange to yellowish gray, (10yr 7/1) to (5yr 7/1). Est. plast. mod. to med. Some calcite stringers. Some gravel. (to 3cm) some sand.
	8.0					Clay 78%	CL	8	0-8.0	Clay. Dk. yellowish orange (10yr 6/6) to lt. olive gray (5y 6/1). Est. plasticity, moderate to high. Trace iron staining. Trace carb. material. Trace CaCO ₃ .
	10.0							9	0-10.0	

Box 1082

Box 2082

2.15 ft

Box 1 New Box

NOTES: General USCS is modified for this log as follows:
Material amounts are estimated by % volume instead of % weight.
(1) Body 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 was labeled "cuttings",

LOG OF BORING NO. 64-86

PAGE 2 OF 2

GEOLOGIST(S): LAA

DATE:

8/18/89

PROJECT NO: 657-1122

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
4x20x2	10.0	1.5(1)				Clay > 80%	CL	10	---	Clay, Grayish orange (10 yr 7/4) to lt. olive gray (5y 6/1). Est. plast. mod. to high. Trace carb. material. Trace CaCO ₃ . Same as above. Predom. lt. olive gray (5y 6/1). Trace iron staining. Same as above. Same as above. Also has dk. yellowish orange coloring.
	11.0					"	CL	11	---	
	12.0	1.1(0)				"	CL	12	---	
	12.3	.7(0)				"	CL	12	---	
	13.0	1.5(1)				"	CL	13	---	
14.0	14.0						14	---	Bottom 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. 65-86

PAGE 1 OF 2

GEOLOGIST(S): UAA

DATE: 5/14/89

PROJECT NO: 657122

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	.3				Clay > 50%	CL		---	sandy clay. Lt. yellowish brown (10 on 40). Est. plast. lim. to mod. Sand v.f.g. to coarse. Mod. to well sorted. Some surficial root material. clayey sand. As above, fine to med. grained.
	0.4					75%	SC		---	
	0.7	.3							---	
Box 1 of 1								1	---	No Sample
								2	---	
								3	---	
			0					4	---	
								5	---	
								6	---	
	7.1							7	---	Clay. Lt. brownish gray (5 on 11). Est. plast. mod. Some sand + gravel @ top of interval becomes siltier as you go down. Some black carb material. Trace iron staining. Gravel fine to 1cm.
						Clay 75%	CL	8	---	
			(1) 22					9	---	
	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.



ROCKY FLATS PLANT

FIGURE NO.

LOG OF BORING NO. 60-86

PAGE 1 OF 2

GEOLOGIST(S): UAF

DATE: 5/23/83

PROJECT NO: 557-22

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	2.3	1.6(1)				Clay 75% Sand ~25%	CL	1		Sandy Clay, dk. yellowish brown (10yr 4/2). Est. plast. med. mod. Sand v.f.g. to med. grain. Some gravel upper end of interval 5/16" angular (to 2cm) Some root material. Some silt.
	1.6							2		No Sample
	6.8	3.2(1)				Clay 75%	CL	7		Clay. Grayish orange (10yr 7/4) to lt. olive brown (5/1 6/1). Est. plast. med. to hard. Trace carb. silts, silt + sand (v.f.g.). Trace carb. material. Becomes siltier toward bottom of interval.
	9.0	1.9(1)				Clay 75%	CL	9		Silty Clay. Grayish orange (10yr 7/4) to pale yellowish brown (10yr 6/2). Est. plast. med. Some iron staining + concretions toward bottom. Traces of carb. s.

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. 46-86

PAGE 2 OF 2

GEOLOGIST(S): *GA*

DATE: *5/16/59*

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
<i>Box top</i>	<i>↑</i>						<i>CL</i>	<i>11</i>		<i>Silty Clay. See previous page for description of this interval.</i>
<i>12.0</i>	<i>12.0</i>							<i>12</i>		<i>Bottom of Box</i>

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. 66-86

PAGE 1 OF 1

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

PROJECT NO: 66-122

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								X	No Samples
	1.0	0						1	-	Clayey sand. Dk. yellowish brown (10YR 4/2). v.f.g. to med. graded. Poor to mod. grading. Sub rounded. Some silt, gravel + root material. Gravel sub angular, to 6cm.
	2.0	.95				Sand 75% Clay 23%		2	-	
	2.5	0							X	No Sample
	3.0	.4(1)				Gravel ≈10%		3	○○○	Gravel. Very pale orange (10YR 8/2) to med gray (N5). Angular to sub angular. Poorly graded (to 7cm).
	4.0	.85				Clay >70%		4	-----	Clay. Grayish orange (10YR 7/4) to Lt. gray (N7). Some silt. + root material. Some caliche stringers at bottom. Trace roots. (Est. plasticity - med. to high)
	4.4	.3(1)				Clay 71%		4	-----	Same as above
	6.0	1.5(2)				Clay >70%		5	-----	Same as above. Caliche becoming more abundant. Becoming silty clay toward bottom. Est. plast. moderate.
	8.0	1.7				Clay >50%		7	-----	Silty Clay. ^{Grayish w/} Very pale orange (10YR 7/4) to Lt. gray (N7). Est. plast. moderate. May be weathered glauconite. Some caliche fractures. ^{Trace} Some iron staining.
	8.0							8	-----	Bottom of Box
								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. 66-86B

PAGE | OF |

GEOLOGIST(S): LAA

DATE: 5/21/59

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	0.6	3 ⁽¹⁾				Silt 75%	OL			Clayey silt. Grayish brown (5yr 3/2). Est. plast. None to low. Some gravel. Subrounded to 4cm. Some roots.
	0.9	2 ⁽²⁾				Gravel 75%	GW			Gravel. Sub rounded. Med. sorted. to 4.5cm. Some clayey silt. (as above). Trace roots.
	1.7	8 ⁽¹⁾				Clay 75%	CL	1		Silty clay. Grayish brown (5yr 3/2). Est. plast. Low to med. Some gravel (granule size). Some sand, v.f.g. to v.c.g. Trace roots.
	2.7	7				Clay 75% Sand 24.5%	CL	2		Sandy clay. Grayish brown (5yr 3/2). Est. plast. Low. Sand v.f.g. to v.c.g. Some silt. Some gravel. Esp. at lower end, to 0.35 cm. Sand gravel well graded. Trace roots.
	3.7	0						3		No Sample
	3.7							4		Bottom of 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. 67-86

GEOLOGIST(S): LAA

DATE: 3/18/37

PROJECT NO: 27-102

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	.6 ⁽¹⁾				Clay 70%	CL			Silty Clay. Dk. yellowish brown (log 4p). Est. plast. mod. to high. Some gravel (2.5cm) some glauconitic material.
	1.5	1.0 ⁽¹⁾				Clay 70%	CL	1		Same as above. Trace root material, trace sand.
								2		Sandy Clay. Very pale orange (log 8p). Est. plast. moderate. Sand v.f.g. Some gravel (to 2.5cm) trace root material.
		1.2 ⁽¹⁾				Clay 75%	CL	3		
								4		
	5.0							5		Silty Sandy Clay. Very pale orange (log 8p). Est. plast. moderate. Sand v.f.g. to coarse. Trace gravel. Appears to have been weathered when put in box. Horizontal to strike parallel to box.
	6.5	1.4 ⁽¹⁾				Clay 75%	CL	6		
	7.1	.5 ⁽¹⁾				Clay 75%	CL	7		
								8		Clayey sand and gravel. Very pale orange (log 8/2). Very well graded. V.f.g. sand to lg. gravel (to 6cm). Sub rounded. Core was watery as above interval.
		1.55 ⁽¹⁾				Gravel ~4% Sand ~4% Clay ~2%	GC	8		
	9.6							9		Same as above
	9.6							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. 67-86

PAGE 2 OF 2

GEOLOGIST(S): CAA

DATE: 5/18/39

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
	9.6									<p>See previous page for description.</p>
	to	1.3(1)					GC	11		
	12.1							12		<p>* Interval ^{sample} consisted of a few pieces of sandy clay. Not enough to accurately characterize interval.</p>
Box 1 of 1	to	* .1						13		
	to							14		
								15		
								16		
16.5	16.5							17		<p>Bottom of Box</p>

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. 69-86

PAGE 1 OF 2

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				550 clay	CL	1	---	Clay brownish gray (5 1/2 4/1), moderate plasticity, some silt and plant debris.
0.5	0.5							2	---	
	to	ND						3	---	Clay, moderate yellowish brown (10 1/2 5/4), moderate plasticity, some silt and very sand, calcareous.
	to							4	---	
	4.9							5	---	As above with mottling brownish gray (5 1/2 4/1), some gravel and roots.
	to	ND						6	---	Interval grades to Clay moderate yellowish brown (10 1/2 5/4), moderate plasticity, some silt, trace of gravel.
	7.0							7	---	
	to	ND						8	---	
	9.0							9	---	
X	9.0							X	X	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. 69-86

PAGE 2 OF 2

GEOLOGIST(S): DCB

DATE: 2/16/89

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
7.0	to	0						11	X	No Sample
12.5	12.5	(1)				fine clay	CL	13	X	Claystone, light olive gray (5 Y 6/1) bedding not apparent, highly weathered, moderately friable, some iron staining.
13.3	to	.4				fine clay	CL	14	X	Sandy Clay, moderate yellow-brown (10 YR 5/4) to light brown (5 YR 5/6), low plasticity, some gravel.
14.5	14.5	3.5						15	X	No Sample As above (reference interval 12.6 to 13.3 ft.)
17.0	to	(1)						16	X	Claystone, light olive gray (5 Y 6/1), with mottled iron stains (dark yellowish orange (10 YR 6/6), bedding not apparent, highly weathered, moderately friable, some soft rock at s.t. color grades to very light gray (N8) with iron staining, plasticized body of caliche 2-3 cm occurs in this interval
17.0	to	(1)						17	X	Claystone, very light gray (N8), mottled by iron staining to dark yellowish orange (10 YR 6/6), bedding not apparent, highly weathered, slightly to moderately friable, some s.t.
								18	X	Bottom of Box 2 of 2 at 17.0
								19	X	

X measures
 added to DCB
 in error

Box 2 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. 69-86 A1

PAGE 1 OF 2

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

PROJECT NO: 657-11.22

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 -1.7	(1) 0.5				65% CLAY 35% SAND	CL	1		SANDY CLAY, dark yellowish brown (10 YR 4/2), mod. plast, trace of iron staining, some roots, trace of gravel
	1.7 -5.0	(1) 1.0 2.8				75% CLAY 15% GRAVEL 10% SAND	CL	2 3		CLAY, dark yellowish brown (10 YR 4/2), ext. mod. plast, some gravel, some sand BOTTOM 2 FT OF INTERVAL: SAME AS ABOVE greenish gray (10 YR 7/4), calcareous
	5.0 -6.0	(1) 1.1				40% SAND 20% CLAY	CL	5		TOP 6 IN: SANDY CLAY, dark yellowish brown (10 YR 4/2), ext. mod. plast, trace of iron staining, some roots, trace of gravel Some as above:
	6.0 -7.0	ND					CL	6		BOTTOM OF INTERVAL: greenish gray (10 YR 7/4) Some trace of calc. material, no gravel (No Rec) Some as above - trace of gravel
	7.0 -8.0	(1) 0.9					CL	7		Some as above - some calc. material
	8.0 -9.0	1.25					CL	8		Some as above
	9.0 -10.0	ND					CL	9		Some as above

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. 70-86

PAGE 1 OF 2

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
0.0	0.0					75% Clay	CL		|||||	Clay, dark yellowish brown (10 YR 5/4), low to moderate plasticity, some silt and plant detritus.
	to	ND				75% Gravel	GC	1	| | | | |	Gravel, dominantly light gray (N7), angular to subangular, poorly graded, max. size 5 cm, some silt and clay
	2.0					75% Clay	CL	2	|||||	Gravelly Clay, dark yellowish brown (10 YR 5/4), low to moderate plasticity, some silt.
	2.0	ND								
	to	ND								
	2.85									
	2.95							3	X	No Sample
	to	0								
	4.0					40% Gravel 30% silt	CL	4	| | | | |	Gravelly Silt Clay, light gray (N7) dominantly dark yellowish brown (10 YR 6/6), low plasticity, abundant iron staining.
	4.0	ND								
	to	0								
	5.0					75% Gravel	GC	5	| | | | |	Clayey Gravel dominantly medium gray (N5) matrix is light gray (N7), angular to subrounded, poorly graded, max size 6 cm, local iron staining.
	to	ND						6	| | | | |	
	7.0					75% Clay	CL	7	|||||	Clay, ^{PCA} light ^{ECC (N5)} olive gray (5 Y 6/1), moderately high plasticity, some silt.
	to							8	|||||	
	9.0					25% Clay		9	|||||	Claystone light brownish gray (5 YR 6/1) bedding not apparent, highly weathered, highly to moderately friable, localized iron staining.
	to									
	11.0									

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.

