From:	Wohlford, Tom
To:	Purcell, Mark; "Deborah.Barr@lm.doe.gov"; Linton, Ron
Cc:	"Bernadette.Tsosie@lm.doe.gov"; "kurt.vollbrecht@state.nm.us"
Subject:	[External_Sender] FW: Homestake - Grants - Onsite SAG well logs
Date:	Wednesday, November 7, 2018 10:47:37 AM
Attachments:	Deep #1 Geophysical Log Integrity Testing.pdf Deep #2 Geophysical Log Integrity Testing.pdf Deep #2 lith log.pdf Deep 1R Drill Log.pdf Deep 2R Drill Log.pdf DEEP#1 Drill Log.pdf Deep#1R Lith Log.pdf Deep#2R Lith Log.pdf

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As requested during the regulatory conference call, please see attached the drill logs for Deep Well No. 1R and No. 2R. Also attached are the geophysical logs for the original Deep Well No. 1 and No. 2. The replacement wells were installed within 50 feet of the original wells.

Regards,

Thomas Wohlford | Closure Manager
Homestake Mining Company- Grants, NM
Mailing Address: PO Box 98, Hwy 605, Grants, NM 87020
Physical Address: 560 Anaconda Road, Route 605, Milan, NM 87021
twohlford@barrick.com
Office: 1-505-287-4456 ext. 34 Fax: 1-505-287-9974
Mobile: +1-505-290-2187

BARRICK
NORTH AMERICA

From: Arguello, Adam
Sent: Wednesday, November 7, 2018 8:23 AM
To: Wohlford, Tom <twohlford@barrick.com>
Subject: FW: Onsite SAG well logs

Tom,

See attached.

Adam Arguello, PE | Senior Hydrogeologist
Homestake Mining Company- Grants, NM
Mailing Address: PO Box 98, Hwy 605, Grants, NM 87020
Physical Address: 560 Anaconda Road, Route 605, Milan, NM 87021
aarguello@barrick.com
Office: 1-505-287-4456 ext. 31 Fax: 1-505-287-9974
Mobile: 1-505-285-1041

From: Arguello, Adam
Sent: Wednesday, October 10, 2018 3:13 PM
To: Wohlford, Tom <twohlford@barrick.com>
Subject: Onsite SAG well logs

Tom,

Attached are various drill, lithology, and geophysical logs for the onsite San Andres wells.

Adam Arguello, PE | Senior Hydrogeologist
Homestake Mining Company- Grants, NM
Mailing Address: PO Box 98, Hwy 605, Grants, NM 87020
Physical Address: 560 Anaconda Road, Route 605, Milan, NM 87021
aarguello@barrick.com
Office: 1-505-287-4456 ext. 31 Fax: 1-505-287-9974
Mobile: 1-505-285-1041

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

1. GENERAL AND WELL LOCATION

OSE POD NO. (WELL NO.)	WELL TAG ID NO.	OSE FILE NO(S).
B-28 POD 1338	Deep IR	

WELL OWNER NAME(S)	PHONE (OPTIONAL)
Homestake Mining Company of CA	505 290-2187

WELL OWNER MAILING ADDRESS	CITY	STATE	ZIP
PO Box 98	Grants	NM	87020

WELL LOCATION (FROM GPS)		DEGREES	MINUTES	SECONDS	
	LATITUDE	35	14	30.72	N
	LONGITUDE	107	51	19.55	W

* ACCURACY REQUIRED: ONE TENTH OF A SECOND

* DATUM REQUIRED: WGS 84

DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS – PLSS (SECTION, TOWNSHIP, RANGE) WHERE AVAILABLE

Next to Large Water Tower on Homestake property

2. DRILLING & CASING INFORMATION

LICENSE NO.	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
WD 1723	Randal Stewart	Stewart Brothers

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
1/9/18	1/22/18	1025	1025	50 ft

COMPLETED WELL IS: (ARTESIAN) DRY HOLE SHALLOW (UNCONFINED) — STATIC WATER LEVEL IN COMPLETED WELL (FT): 165

DRILLING FLUID: AIR (MUD) ADDITIVES – SPECIFY:

DRILLING METHOD: (ROTARY) HAMMER CABLE TOOL OTHER – SPECIFY:

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE (add coupling diameter)	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
0	100	24	LCS 16" .375	Weld	15 1/4	.375	
0	955	14 3/4	304 SS Blank	Weld	10	.36	

3. ANNULAR MATERIAL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT
0	100	24	Neat Cement	15 yds	Tremie
0	955	14 3/4	Neat Cement	27 yds	Pressure

FOR OSE INTERNAL USE

FILE NO.	POD NO.	TRN NO.
LOCATION	WELL TAG ID NO.	PAGE 1 OF 2

WR-20 WELL RECORD & LOG (Version 06/30/17)

4. HYDROGEOLOGIC LOG OF WELL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES (attach supplemental sheets to fully describe all units)	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER-BEARING ZONES (gpm)
0	100	100	Overburden, Clay and wet Sand	Y (N)	
100	200	100	Clay and Shale	Y (N)	
200	300	100	Shale	Y (N)	
300	400	100	Sandy Shale & Clay	Y (N)	
400	500	100	Clay and Sand	Y (N)	
500	600	100	Shale	Y (N)	
600	700	100	Clay and Sandy Shales	Y (N)	
700	955	255	Shale and Sandy Clay	Y (N)	
955	1025	70	Sand	(Y) N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	

METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA:

☐ PUMP ☒ AIR LIFT ☐ BAILER ☐ OTHER – SPECIFY:

TOTAL ESTIMATED WELL YIELD (gpm): 0

5. TEST; RIG SUPERVISION

WELL TEST — TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING DISCHARGE METHOD, START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.

MISCELLANEOUS INFORMATION:

Well not tested at time of completion.

PRINT NAME(S) OF DRILL RIG SUPERVISOR(S) THAT PROVIDED ONSITE SUPERVISION OF WELL CONSTRUCTION OTHER THAN LICENSEE:

Davis Gaddy, Randy Stewart

6. SIGNATURE

THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 30 DAYS AFTER COMPLETION OF WELL DRILLING:

Randy Stewart — Randy Stewart — 2/20/18

SIGNATURE OF DRILLER / PRINT SIGNEE NAME — DATE

FOR OSE INTERNAL USE — WR-20 WELL RECORD & LOG (Version 06/30/2017)

FILE NO.	POD NO.	TRN NO.	
LOCATION		WELL TAG ID NO.	PAGE 2 OF 2

HYDRO-ENGINEERING, LLC

Lithologic Log

Well Name:	Deep Well No. 1R	Start Date:	12/19/2017
Driller:	Stewart Brothers	Eng/Geog:	Adam Arguello

0-22'	70% brown clay; 30% brown sand, damp
22-42'	fine flowing sand, damp
42-47'	70% red clay; 30% tan sand, saturated
47'-60'	90% red and brown shale; 10% white sandstone
60'-80'	brown and red shale
80'-100'	brown and gray shale
100'-300'	red and purple shale
300'-320'	Sandstone
320'-420'	Purple shale
420'-470'	Sandstone
470'-620'	90% red shale; 10% white and grey limestone
620'-850'	Purple shale
850'-955'	90% red shale; 10% grey limestone
955'-1025'	grey and red sandstone and grey limestone

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

STATE ENGINEER OFFICE
2018 MAR 16 P 1:20

1. GENERAL AND WELL LOCATION

OSE POD NO. (WELL NO.)	WELL TAG ID NO.	OSE FILE NO(S).
B-28 POD 1339	Deep 2R	

WELL OWNER NAME(S)	PHONE (OPTIONAL)
Homestake Mining Company of California	505-290-2187

WELL OWNER MAILING ADDRESS	CITY	STATE	ZIP
PO Box 98	Grants	NM	87020

WELL LOCATION (FROM GPS)		DEGREES	MINUTES	SECONDS	
	LATITUDE	35	14	12.19	N
	LONGITUDE	107	51	51.50	W

* ACCURACY REQUIRED: ONE TENTH OF A SECOND
* DATUM REQUIRED: WGS 84

DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS – PLSS (SECTION, TOWNSHIP, RANGE) WHERE AVAILABLE

Take Hwy 605 NE to County Rd 334, turn left on 334. Check in at Homestake front office for directions to site.

2. DRILLING & CASING INFORMATION

LICENSE NO.	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
WD-1723	Randal P. Stewart	Stewart Brothers Drilling Co

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
3/20/18	4/17/18	870	870	800

COMPLETED WELL IS: (ARTESIAN) DRY HOLE SHALLOW (UNCONFINED)

STATIC WATER LEVEL IN COMPLETED WELL (FT): Approx. 165 ft

DRILLING FLUID: AIR (MUD) ADDITIVES – SPECIFY:

DRILLING METHOD: (ROTARY) HAMMER CABLE TOOL OTHER – SPECIFY: Flood Reverse

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE (add coupling diameter)	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
0	130	22	Low Carbon,	Welded	15.25	.375	
130	800	14.75	304/304L SS 62.64#	Welded	10.02	.365	
800	870	9.875	None	None			Open Hole

3. ANNULAR MATERIAL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT
0	130	22	Neat Cement API Type B	270	Tremie
0	800	14.75	Neat Cement API Type B	594	Pressure Cement
800	870	9.875	Open Hole Completion		

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/30/17)

FILE NO.	POD NO.	TRN NO.	
LOCATION		WELL TAG ID NO.	PAGE 1 OF 2

4. HYDROGEOLOGIC LOG OF WELL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES **(attach supplemental sheets to fully describe all units)**	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER-BEARING ZONES (gpm)
0	120	120	Valley Fill - Sand, silty grayish-red sand medium to course grains	Y N	
120	330	210	Chinle Formation - Shale, Sand and gravel. Red shale, fine to med. grain	Y N	
330	610	280	Triassic System - Chinle Continued, Shale and grayish red shale.	Y N	
610	800	190	Triassic System continued - Shale and Limestone	Y N	
800	870	70	San Andres Limeston	Y N	250
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	

METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA:

☐ PUMP ☑ AIR LIFT ☐ BAILER ☐ OTHER – SPECIFY:

TOTAL ESTIMATED WELL YIELD (gpm): 400

5. TEST; RIG SUPERVISION

WELL TEST — TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING DISCHARGE METHOD, START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.

MISCELLANEOUS INFORMATION: Well was not tested, only airlifted. Approx. 250 GPM

PRINT NAME(S) OF DRILL RIG SUPERVISOR(S) THAT PROVIDED ONSITE SUPERVISION OF WELL CONSTRUCTION OTHER THAN LICENSEE:

Randy Stewart, Don Ward

6. SIGNATURE

THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 30 DAYS AFTER COMPLETION OF WELL DRILLING:

Randy Stewart Randy Stewart — 4/17/18

SIGNATURE OF DRILLER / PRINT SIGNEE NAME — DATE

FOR OSE INTERNAL USE — WR-20 WELL RECORD & LOG (Version 06/30/2017)

FILE NO.	POD NO.	TRN NO.	
LOCATION		WELL TAG ID NO.	PAGE 2 OF 2

Lithologic Log

Well Name:	Deep Well No. 2R	Start Date:	3/19/2018
Driller:	Stewart Brothers	Eng/Geog:	Adam Arguello

0'-20'	70% brown clay; 30% brown sand
20'-80'	tan and red sand
80'-120'	70% tan sand; 30% red clay
120'-160'	red shale
160-170'	reddish purple sandstone
170'-280'	red and grey shale
280'-300'	purple shale
300'-330'	red and white sandstone
330'-440'	90% red shale; 10% white and grey limestone
440'-480'	80% purple shale; 20% grey limestone flecks
480'-710'	Reddish purple shale
710'-800'	90% red shale; 10% grey limestone
800-870'	grey and red sandstone and grey limestone

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

DEEP NO. 1

(A) Owner of well United Nuclear-Homestake Partners Owner's Well No. B-28-A (Explor
Street or Post Office Address P.O. Box 98
City and State Grants, New Mexico

Well was drilled under Permit No. B-28-A (Explor.) and is located in the:

a. ___ ¼ NW ¼ NE ¼ SE ¼ of Section 26 Township 12N Range 10W N.M.P.M.

b. Tract No. ___ of Map No. ___ of the ___

c. Lot No. ___ of Block No. ___ of the ___
Subdivision, recorded in ___ County.

d. X= ___ feet, Y= ___ feet, N.M. Coordinate System ___ Zone in the ___ Grant.

(B) Drilling Contractor United Nuclear-Homestake Partners License No. WD-704

Address P.O. Box 98, Grants, NM 87020

Drilling Began 1-14-79 Completed 1-27-79 Type tools ___ Size of hole ___ in.

Elevation of land surface or ___ at well is ≅6575 ft. Total depth of well 1000 ft.

Completed well is ☐ shallow ☒ artesian. Depth to water upon completion of well 137 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet		Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
From	To			
955	999	44	San Andres limestone	850

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet		Length (feet)	Type of Shoe	Perforations	
			Top	Bottom			From	To
16" OD	62.58	Welded	0	300	300			
9 5/8 OD	35	Welded	300	999	699		919	999
urface 24"	corrigated culvert pipe	Welded	0	50	50			

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet		Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement
From	To				
urface 0	50	30"		88	Pump
0	300	20"		284	Pump thru center of casing with plug at 929 ft thru 10 ft. of
300	929	12 3/4"		240	perforations until cement came to surface (drilled out plug)

Section 5. PLUGGING RECORD

Plugging Contractor ___
Address ___
Plugging Method ___
Date Well Plugged ___
Plugging approved by:
___
State Engineer Representative

No.	Depth in Feet		Cubic Feet of Cement
	Top	Bottom	
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received

Quad ___ FWL ___ FSL ___

File No. ___ Use ___ Location No. ___

Section 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
0	120	120	Clay and Sand
120	284	164	Shale
284	307	23	Shale and Sandstone
307	319	12	Sandstone
319	347	28	Shale and Sandstone
347	377	30	Shale
377	395	18	Shale and Sandstone
395	414	19	Sandstone
414	433	19	Shale
433	450	17	Sandstone
450	459	9	Shale
459	476	17	Sandstone
476	596	120	Shale
596	615	19	Sandstone
615	708	93	Shale
708	723	15	Sandstone
723	788	65	Shale and Sandstone
788	812	24	Shale
812	829	17	Sandstone
829	870	41	Shale
870	955	85	Sandstone and Shale
955	999	44	San Andres limestone

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

JET WEST
GEOPHYSICAL SERVICES, LLC.

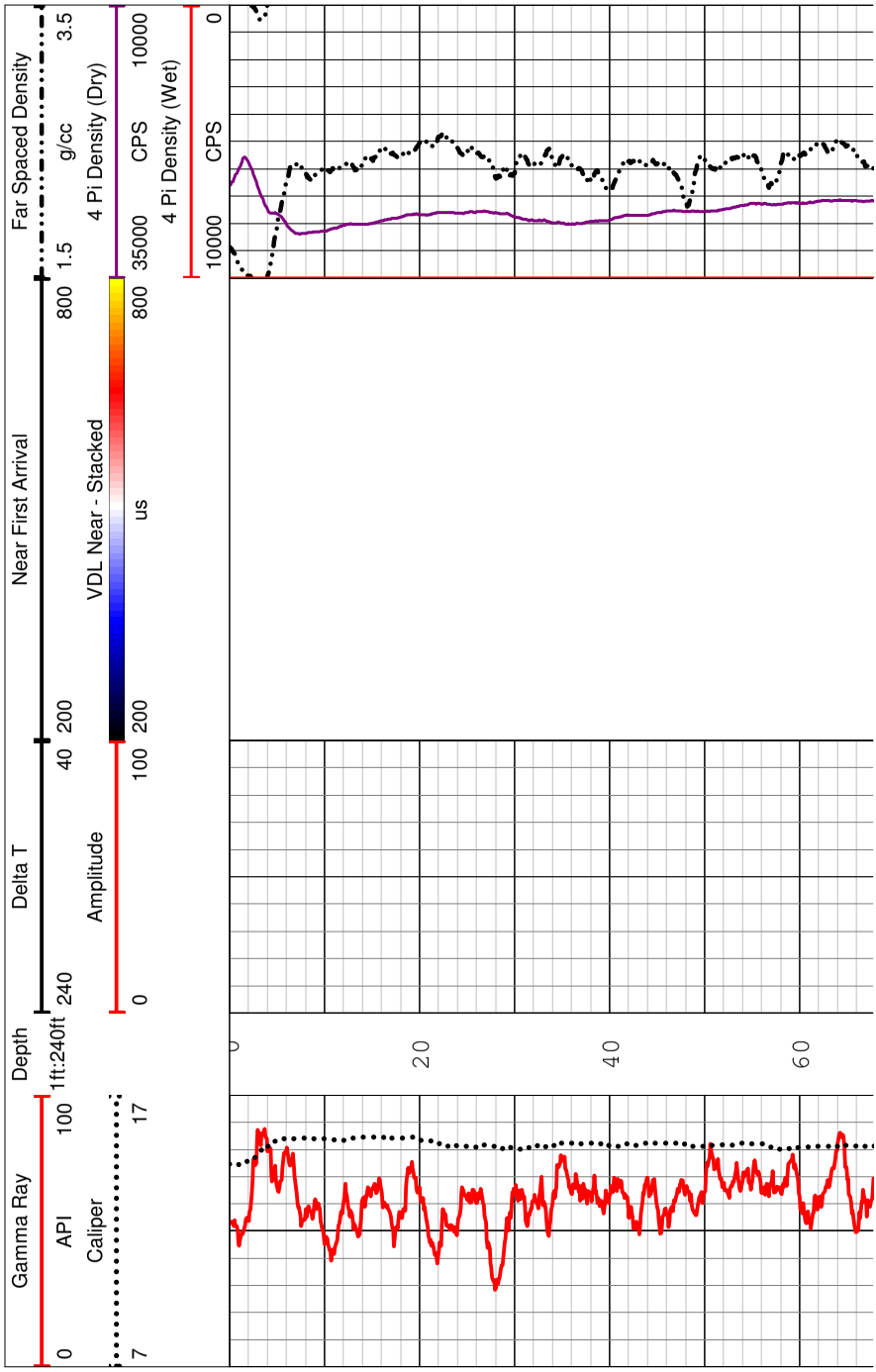
COMPANY	Homestake Mining Company
WELL ID	#1 Deep
FIELD	Grants
COUNTY	Cibola STATE New Mexico
TYPE OF LOG:	**Gamma Ray, 3 Arm Caliper, Sonic, 4 Pi Density**
OTHER SERVICES	Video
LOCATION	
SEC TWP RGE	API No.
Northing: Easting:	

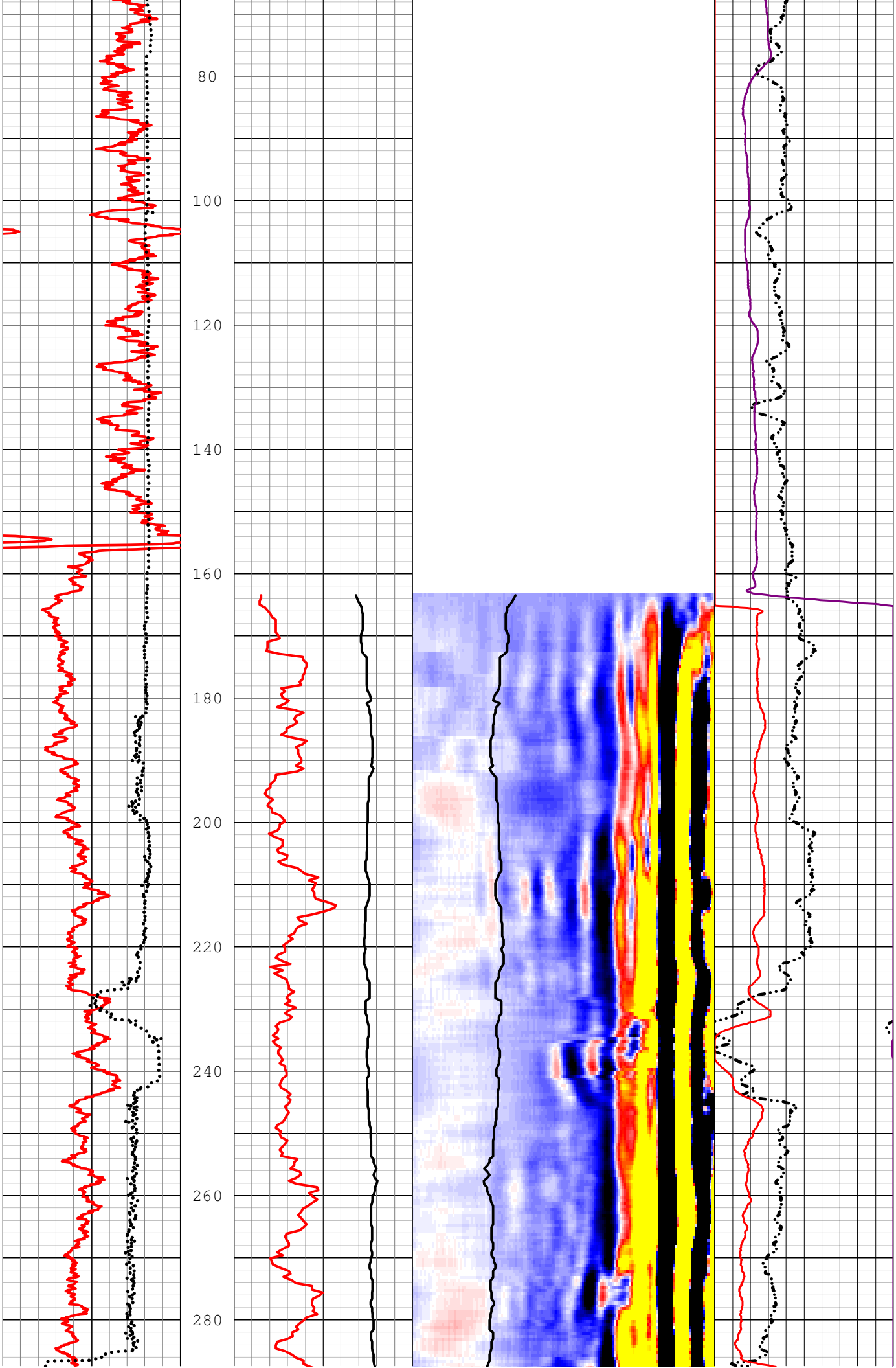
PERMANENT DATUM	Ground Level	ELEVATION	K.B.
LOG MEAS. FROM	Ground Level	ABOVE PERM. DATUM	T.O.C
DRILLING MEAS. FROM	Ground Level		G.L.

DATE	05-17-2016	TYPE FLUID IN HOLE	water
RUN No.	One	SALINITY	
TYPE LOG	QL-GR-3Arm, 4Pi, Sonic	DENSITY	
DEPTH-DRILLER	1000 ft.	LEVEL	156 ft.
DEPTH-LOGGER	1027 ft.	MAX. REG. TEMP	
BTM LOGGED INTERVAL	1025 ft.	DIGITIZE INTERVAL	0.1 ft.
TOP LOGGED INTERVAL	Surface		
OPERATING RIG TIME			
RECORDED BY	T. Staatz / J. White		
WITNESSED BY	A. Venable		

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
1	30 in.	0 ft.	50 ft.	24 in.	Corr. Steel	Surface	50 ft.
2	20 in.	0 ft.	300 ft.	16 in.	Steel	Surface	300 ft.
3	12.75 in.	300 ft.	999 ft.	9.625 in.	Steel	300 ft.	999 ft.

REMARKS:

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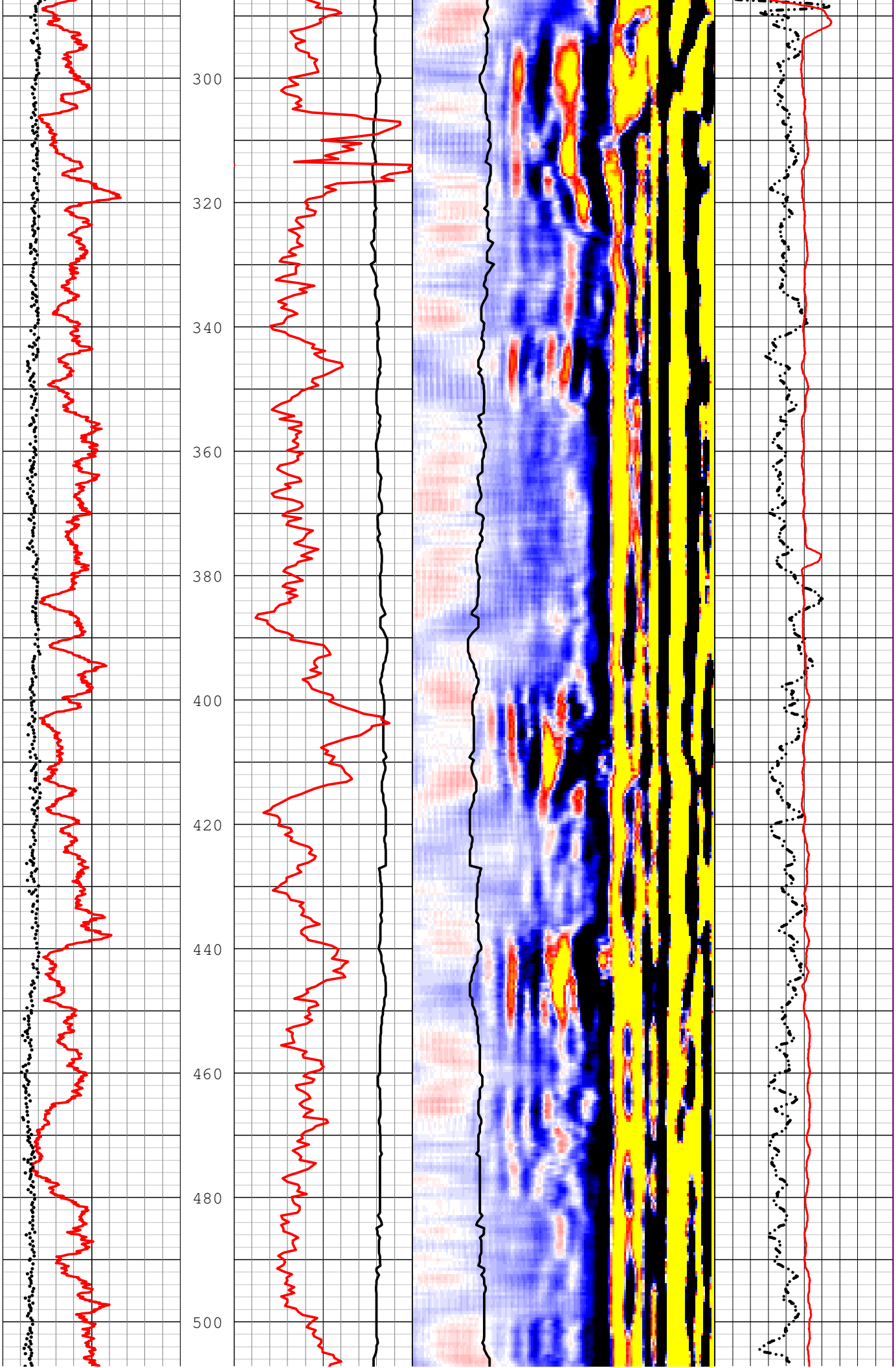
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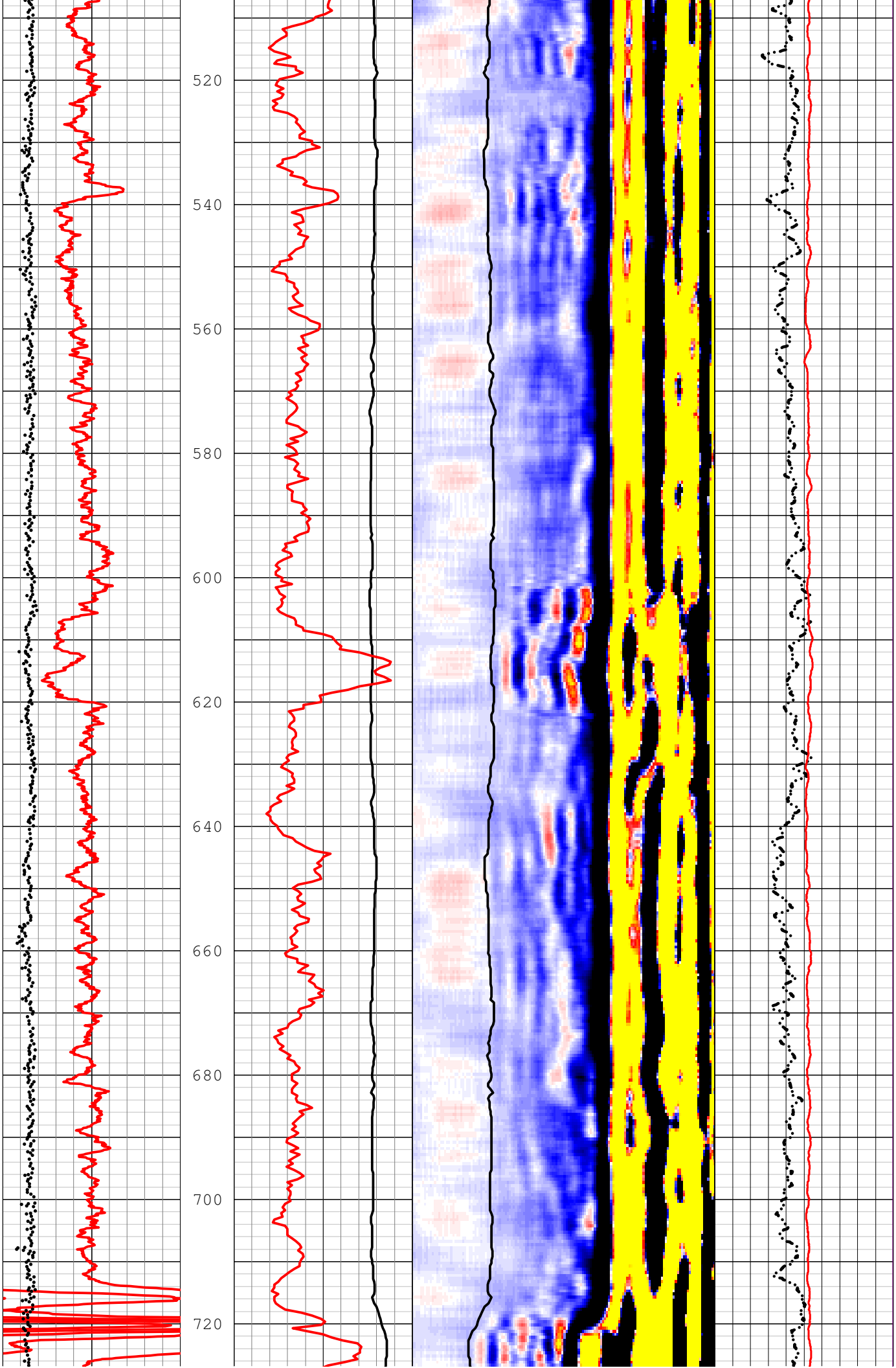
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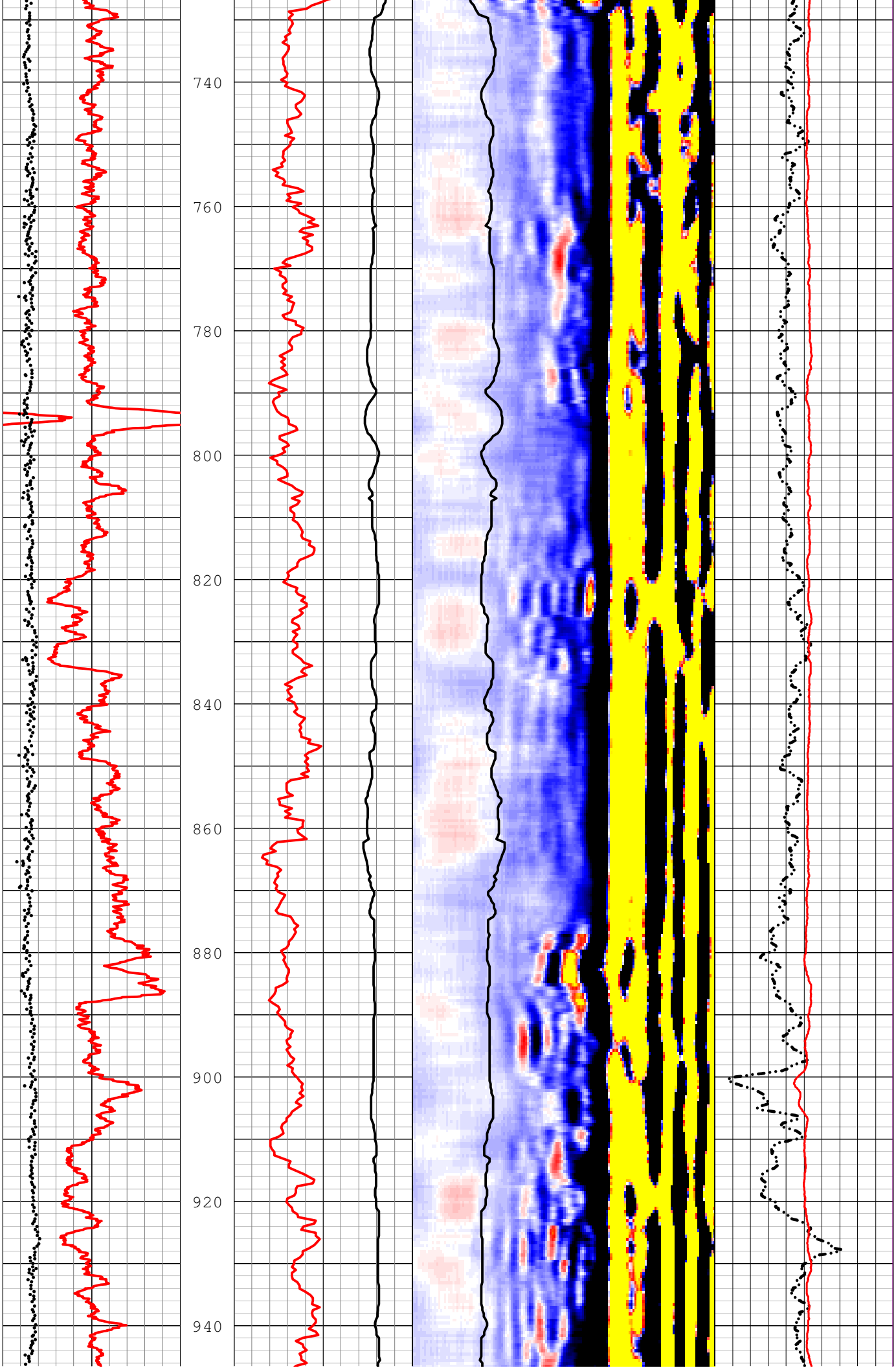
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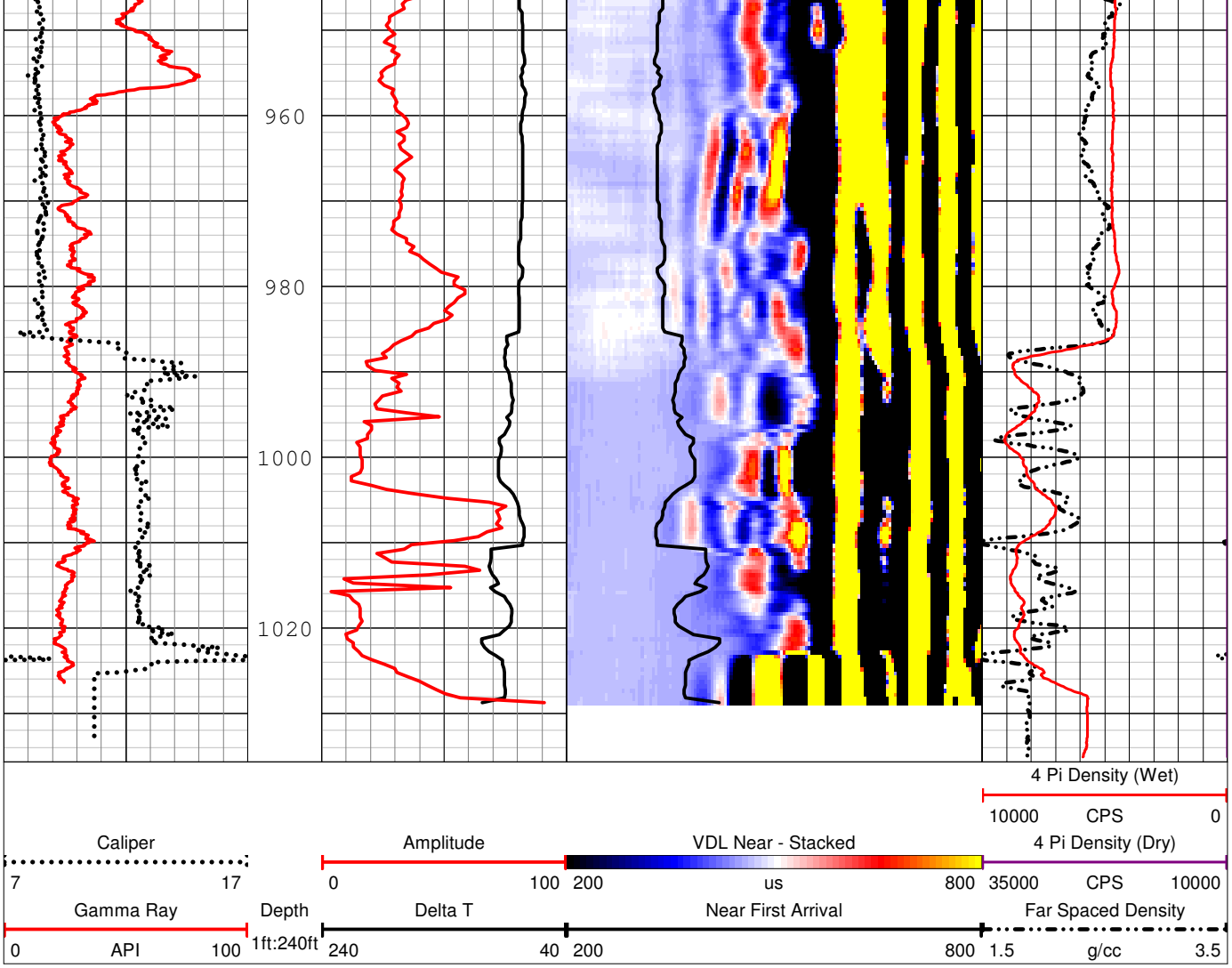
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980
1000
1020
4 Pi Density (Wet)
10000 CPS 0
Caliper
7 17
Amplitude
0 100
VDL Near - Stacked
200 us 800
4 Pi Density (Dry)
35000 CPS 10000
Gamma Ray
0 API 100
Depth
1ft:240ft
Delta T
240 40
Near First Arrival
200 800
Far Spaced Density
1.5 g/cc 3.5

TABLE 6 (continued)

Stratigraphic unit and material	Thickness (feet)	Depth (feet)
12.10.26.242 Homestake-Sapin Partners (continued)		
TRIASSIC SYSTEM (continued)		
Chinle formation (continued)		
Clay and shale, varicolored, and sandstone ...	115	835
Shale, gray and brown	5	840
Shale, purple and gray	5	845
Shale, purple, gray, and red; and red sandstone	5	850
Clay, light-red, and gray sandstone	5	855
Shale, gray, and sandstone	5	860
Shale, red and gray	20	880
Shale, gray, and sandstone	10	890
Shale, purple and gray, and sandstone	5	895
Sandstone and gray shale	5	900
Shale, purple and red, and sandstone	35	935
Shale, gray, and sandstone	25	960
Shale, gray and red, and boulders	10	970
Shale, purple, red, and gray, and sandstone ..	5	975
PERMIAN SYSTEM:		
San Andres limestone:		
Lost circulation	5	980
12.10.26.322a Homestake-New Mexico Partners		
QUATERNARY SYSTEM:		
Valley fill:		
Sand, grayish-orange, fine to coarse, rounded; chiefly frosted, quartz grains; some grayish-orange clay	10	10
Sand, grayish-orange, fine to coarse, rounded; chiefly frosted quartz	20	30
Sand, light-brown, fine to coarse, rounded; light-brown, frosted quartz	10	40
Sand, light-brown, fine to very coarse, rounded to subrounded; chiefly quartz	10	50
Sand, light-brown, fine to very coarse, 90 percent rounded to angular quartz grains; less than 10 percent light-olive-gray limestone fragments	10	60
Sand, grayish-orange, fine to very coarse, 30 percent subrounded to angular quartz; some medium to very coarse rock fragments; obsidian, and fossil fragments	10	70
Sand, grayish-orange, fine to coarse with granules, quartz 50 percent subrounded to angular quartz grains; some fossils	10	80
Sand, grayish-orange, fine to coarse with granules, 60 percent rounded to angular, frosted quartz grains; some subrounded shell fragments	10	90

TABLE 6 (continued)

Stratigraphic unit and material	Thickness (feet)	Depth (feet)
12.10.26.322a Homestake-New Mexico Partners (continued)		
QUATERNARY SYSTEM (continued)		
Valley fill (continued)		
Sand, grayish-orange-pink, fine to coarse with granules; 30 percent rounded to subangular, frosted quartz grains; some subrounded shell fragments	10	100
Sand, silty, grayish-red; sand is medium to very coarse with granules; 30 percent rounded to angular, frosted quartz	10	110
TRIASSIC SYSTEM:		
Chinle formation:		
Shale, sand, and gravel; 65 percent grayish-red shale; 20 percent fine to coarse, rounded to subangular quartz; 15 percent subrounded to angular gravel	10	120
Shale, sand, and gravel; 70 percent grayish-red shale; 15 percent medium to coarse, rounded to angular, frosted quartz; 15 percent subrounded to angular gravel	20	140
Shale, sand, and gravel; 60 percent grayish-red shale; 20 percent fine to medium, subrounded quartz, sand; 20 percent subrounded gravel	10	150
Shale, sandstone, and gravel; 60 percent grayish-red shale; light-gray, very fine-grained sandstone with subrounded, frosted quartz grains; 20 percent subrounded gravel	10	160
Sandstone, shale, and gravel; 50 percent light-gray, very fine- to fine-grained sandstone with subrounded grains; 25 percent grayish-red shale; 25 percent subrounded gravel	10	170
Shale and sandstone; 80 percent grayish-red shale; 20 percent very fine to fine and subrounded frosted quartz grains	10	180
Shale and sand; 80 percent grayish-red shale; 20 percent very fine to fine, subrounded to angular sand	20	200
Shale and sand; 90 percent grayish-red shale; 10 percent very fine, rounded to angular quartz sand grains	20	220
Shale, grayish-red	70	290
Shale, grayish-red; less than 5 percent frosted grains of very fine; subrounded, quartz sand	10	300
Shale and sandstone; 60 percent grayish-red shale; 40 percent light-gray, frosted quartz, very fine-grained sandstone with rounded to angular, frosted quartz grains	20	320

TABLE 6 (continued)

Stratigraphic unit and material	Thickness (feet)	Depth (feet)
12.10.26.322a Homestake-New Mexico Partners (continued)		
TRIASSIC SYSTEM (continued)		
Chinle formation (continued)		
Shale and sandstone; 80 percent grayish-red shale; 20 percent light-gray, very fine-grained sandstone with round to angular quartz grains	10	330
Shale, grayish-red	20	350
Shale and sandstone; 60 percent grayish-red shale; 40 percent light-gray, very fine-grained sandstone with rounded to angular, frosted quartz grains	20	370
Shale and sandstone; 80 percent grayish-red shale; 20 percent light-gray, very fine-grained quartz sandstone	40	410
Shale and sandstone; 80 percent grayish-red shale; 20 percent light-gray, very fine-grained sandstone in lenses 2 mm wide banded with shale	20	430
Shale, grayish-red	10	440
Shale and limestone; 80 percent grayish-red shale; 20 percent light-brownish-gray; medium-grained crystalline limestone	40	480
Shale, grayish-red	10	490
Shale and limestone; 90 percent grayish-red shale; 10 percent light-brownish-gray limestone	10	500
Shale, pale-red to grayish-red	20	520
Shale and limestone; 90 percent pale-red to grayish-red shale; 10 percent very light-gray, medium-grained crystalline limestone	10	530
Shale, limestone, and sandstone; 70 percent pale-red to grayish-red shale; 20 percent very light-gray, medium-grained crystalline limestone; 10 percent white, fine-grained sandstone	20	550
Shale and limestone; 90 percent grayish-red shale; 10 percent light-gray, medium-grained, crystalline limestone	10	560
Shale, grayish-red	10	570
Shale and sandstone; 90 percent grayish-red shale; 10 percent pale-greenish-yellow, very fine-grained sandstone	10	580
Shale, sandstone, and limestone; 80 percent grayish-red shale; 10 percent pale-greenish-yellow, very fine-grained sandstone; 10 percent light-gray limestone	10	590
Shale, limestone, and sandstone; 60 percent grayish-red shale; 20 percent light-gray limestone; 20 percent light-greenish-yellow, very fine sandstone	10	600

TABLE 6 (continued)

Stratigraphic unit and material	Thickness (feet)	Depth (feet)
12.10.26.322a Homestake-New Mexico Partners (continued)		
TRIASSIC SYSTEM (continued)		
Chinle formation (continued)		
Shale and limestone; 80 percent grayish-red shale; 20 percent light-gray limestone	10	610
Shale, grayish-red	20	630
Shale, grayish-red; micaceous	30	660
Shale and sandstone; 80 percent grayish-red shale; 20 percent light-greenish-yellow, sandstone, very fine grained	10	670
Shale, grayish-red	10	680
Shale and sandstone; 90 percent pale-red shale; 10 percent light-brownish-red very fine-grained sandstone with calcium carbonate cement	10	690
Shale, pale-red	20	710
Shale and sandstone; 90 percent light-gray shale; 10 percent light-gray sandstone with calcium carbonate cement	10	720
Shale, light-gray	30	750
Shale and sandstone; 70 percent pale-red shale; 30 percent light-gray, very fine-grained sandstone	10	760
Shale, pale-red; sandstone and limestone less than 5 percent	30	790
Shale and silty limestone, 60 percent pale-brown shale; 40 percent light-gray to medium-gray grading to moderate-red, silty limestone with mixed texture	10	800
PERMIAN SYSTEM:		
San Andres limestone:		
Sandstone, shale, and limestone; 70 percent very pale-orange to moderate-red, fine-to very coarse-grained and granule sandstone with subrounded to angular grains; 15 percent grayish-red shale; 15 percent light-gray to medium-gray and moderate-red limestone ...	10	810
Sandstone and limestone; 80 percent light-gray to moderate-red, very fine-to medium-grained sandstone with subrounded to angular grains; light-gray to medium-gray, medium-grained crystalline limestone	10	820
Sandstone and limestone; 90 percent moderate-red, very fine-to medium-grained sandstone with subrounded to subangular grains and calcium carbonate cement; 10 percent light-gray to medium-gray, medium-grained crystalline limestone	10	830

TABLE 6 (continued)

Stratigraphic unit and material	Thickness (feet)	Depth (feet)
12.10.26.322a Homestake-New Mexico Partners (continued)		
PERMIAN SYSTEM (continued)		
San Andres limestone (continued)		
Sandstone and limestone; 95 percent yellowish-orange to moderate-red, fine-to medium-grained sandstone with subrounded to angular grains and calcium carbonate cement; 5 percent light-gray to moderate-gray, medium-grained crystalline limestone	10	840
Sandstone, moderate-red, fine-to medium-grained, subrounded to angular with calcium carbonate cement	10	850
Sand, pale-yellowish-brown, very fine to coarse and granular, rounded to angular; 85 percent frosted quartz	20	870
12.10.27.431 W. A. Murray		
Well 806		
QUATERNARY SYSTEM:		
Valley fill:		
Sandstone, grayish-orange, fine- to very coarse-grained, rounded to subrounded, frosted quartz 70 percent, very friable	10	10
Sandstone, grayish-orange, fine- to very coarse-grained, rounded to subrounded; frosted quartz 70 percent; subangular fragment of moderate-red vesicular lava 1 mm across; very friable	10	20
Same as above, except without lava fragments	20	40
Sand, grayish-orange, fine to coarse, rounded to angular; frosted quartz 60 percent	20	60
Sand, grayish-orange, very fine to medium, rounded to subangular; frosted quartz 60 percent	30	90
TRIASSIC SYSTEM:		
Chinle formation:		
Shale and sand; 80 percent grayish-red shale; 20 percent grayish-orange fine to coarse, subrounded to angular grains of frosted quartz sand	10	100
Shale, limestone, and sand; 90 percent grayish-red shale; 5 percent light-gray limestone; 5 percent fine to coarse, subrounded to subangular frosted quartz sand	20	120
Shale, sandstone, limestone, and sand; 80 percent grayish-purple shale; 10 percent light-gray to light-brownish-gray, very fine-grained, subrounded sandstone; 5 percent light-medium-gray limestone; 5 percent fine to medium, subrounded, frosted quartz sand	30	150

JET WEST
GEOPHYSICAL SERVICES, LLC.

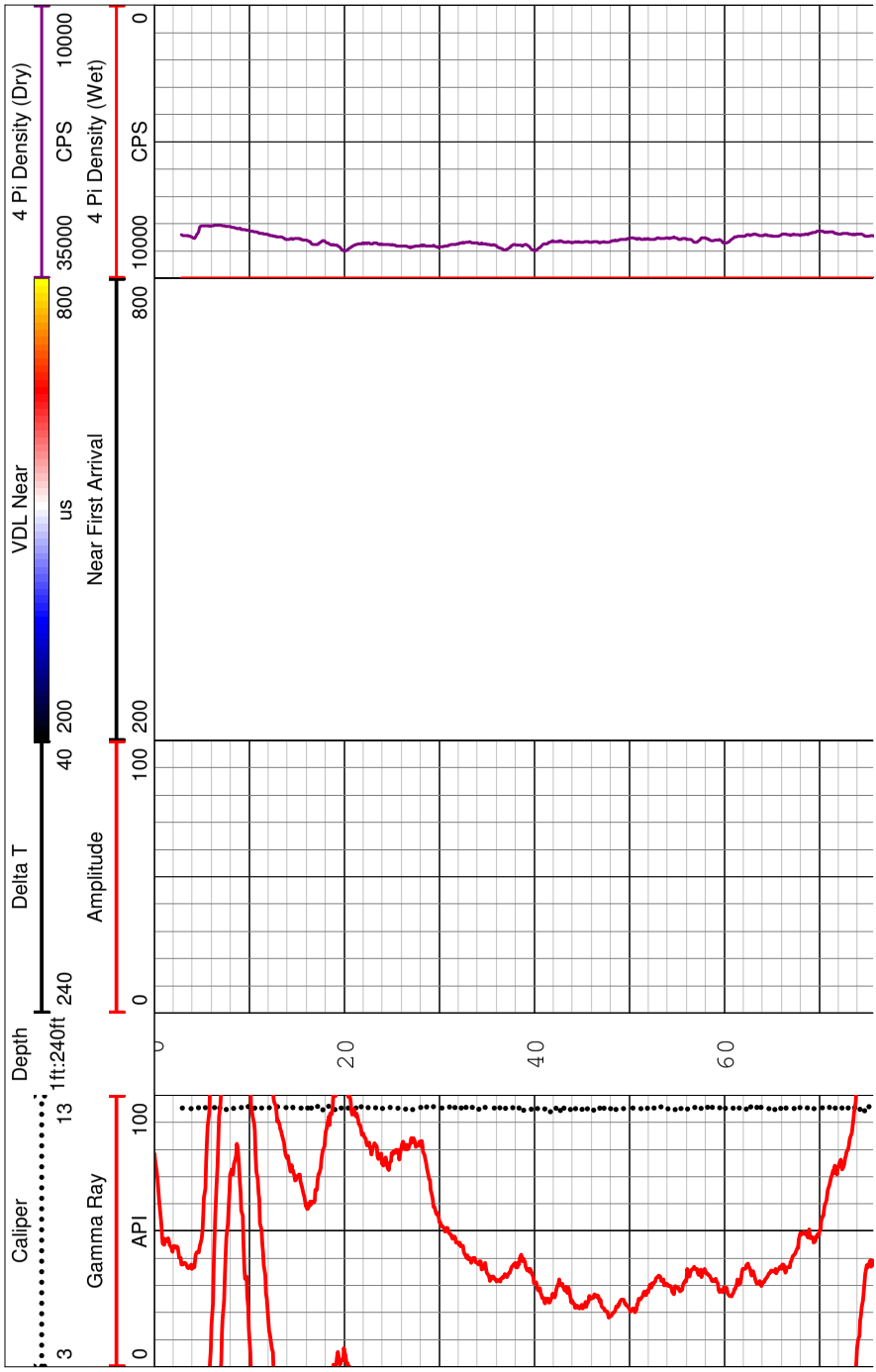
COMPANY	Homestake Mining Company
WELL ID	#2 Deep
FIELD	Grants
COUNTY	Cibola STATE New Mexico
TYPE OF LOG:	**Gamma Ray, 3 Arm Caliper, Sonic, 4 Pi Density**
OTHER SERVICES	Video
LOCATION	
SEC TWP RGE	API No.
Northing: Easting:	

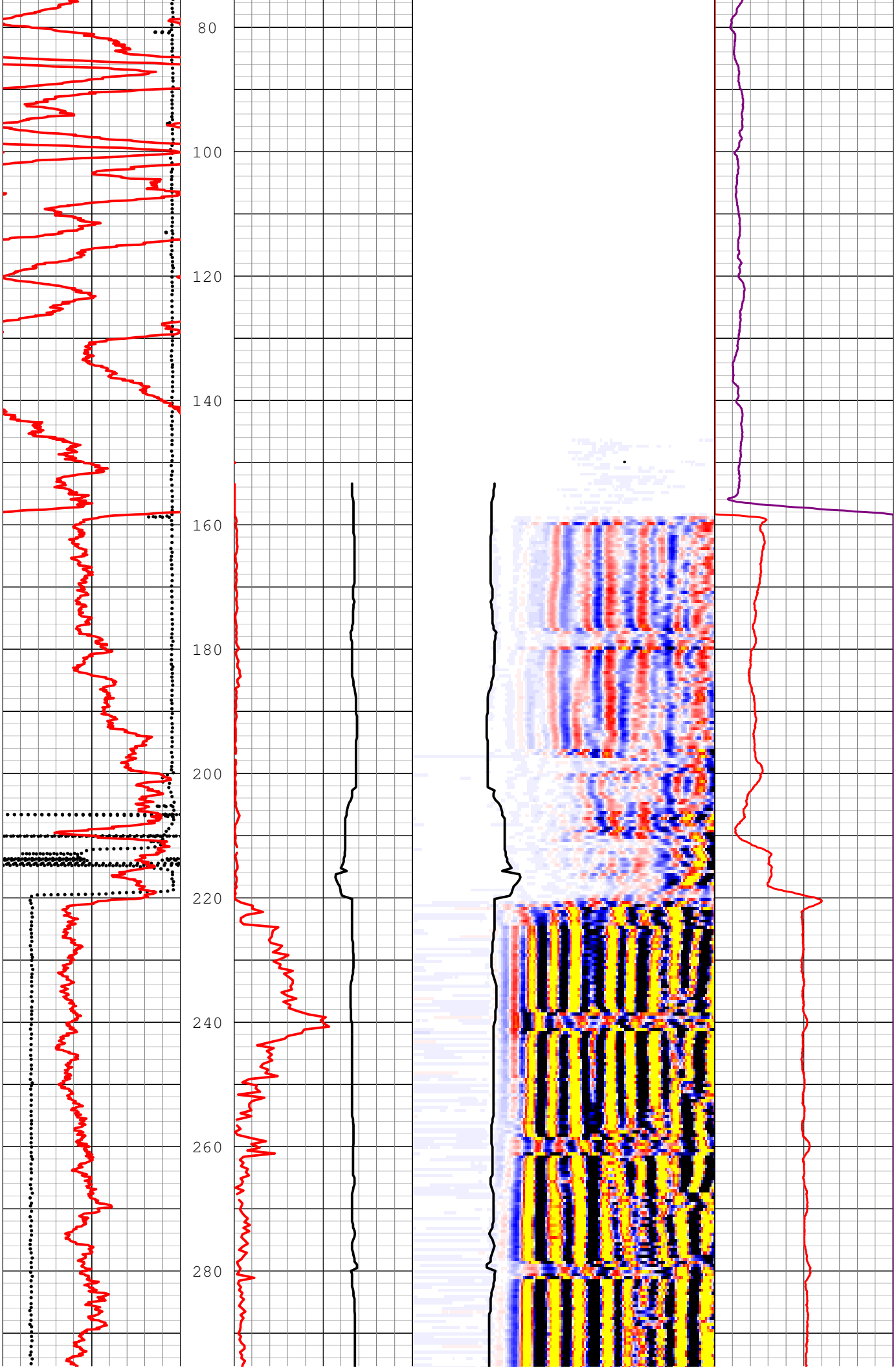
PERMANENT DATUM	Ground Level	ELEVATION	K.B.
LOG MEAS. FROM	Ground Level	ABOVE PERM. DATUM	T.O.C
DRILLING MEAS. FROM	Ground Level		G.L.

DATE	05-18-2016	TYPE FLUID IN HOLE	water
RUN No.	One	SALINITY	
TYPE LOG	QL-GR-3Arm, 4Pi, Sonic	DENSITY	
DEPTH-DRILLER	823 ft.	LEVEL	156 ft.
DEPTH-LOGGER	817 ft.	MAX. REG. TEMP	
BTM LOGGED INTERVAL	815 ft.	DIGITIZE INTERVAL	0.1 ft.
TOP LOGGED INTERVAL	Surface		
OPERATING RIG TIME			
RECORDED BY	T. Staatz / J. White		
WITNESSED BY	A. Venable		

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
1				12.5 in. O.D.	Fiberglass	Surf.	220
2				4.5 in. O. D.	Fiberglass	220 ft.	423 ft.
3				4.5 in. O.D.	Slotted FG	423 ft.	823 ft.

REMARKS:

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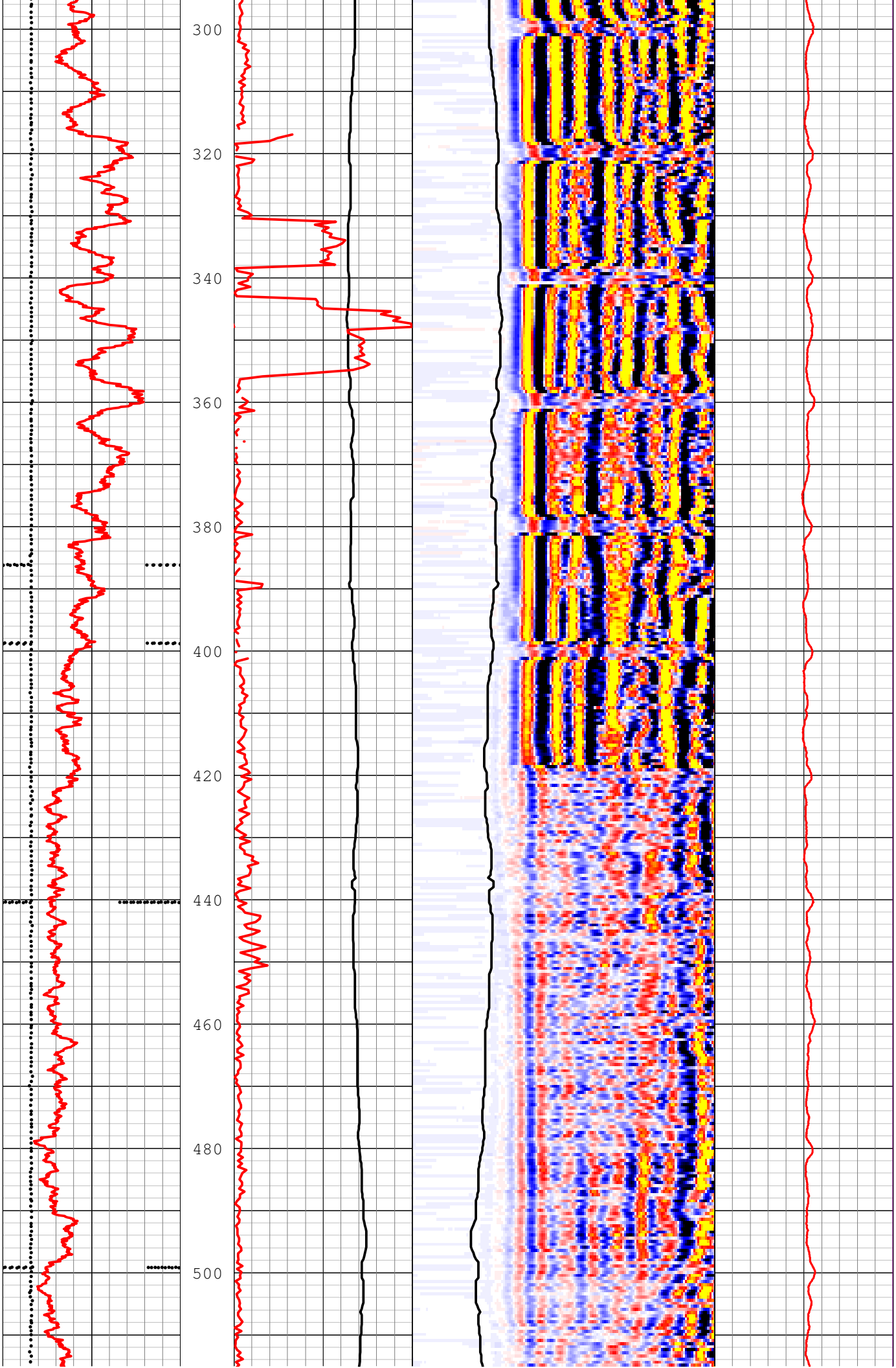
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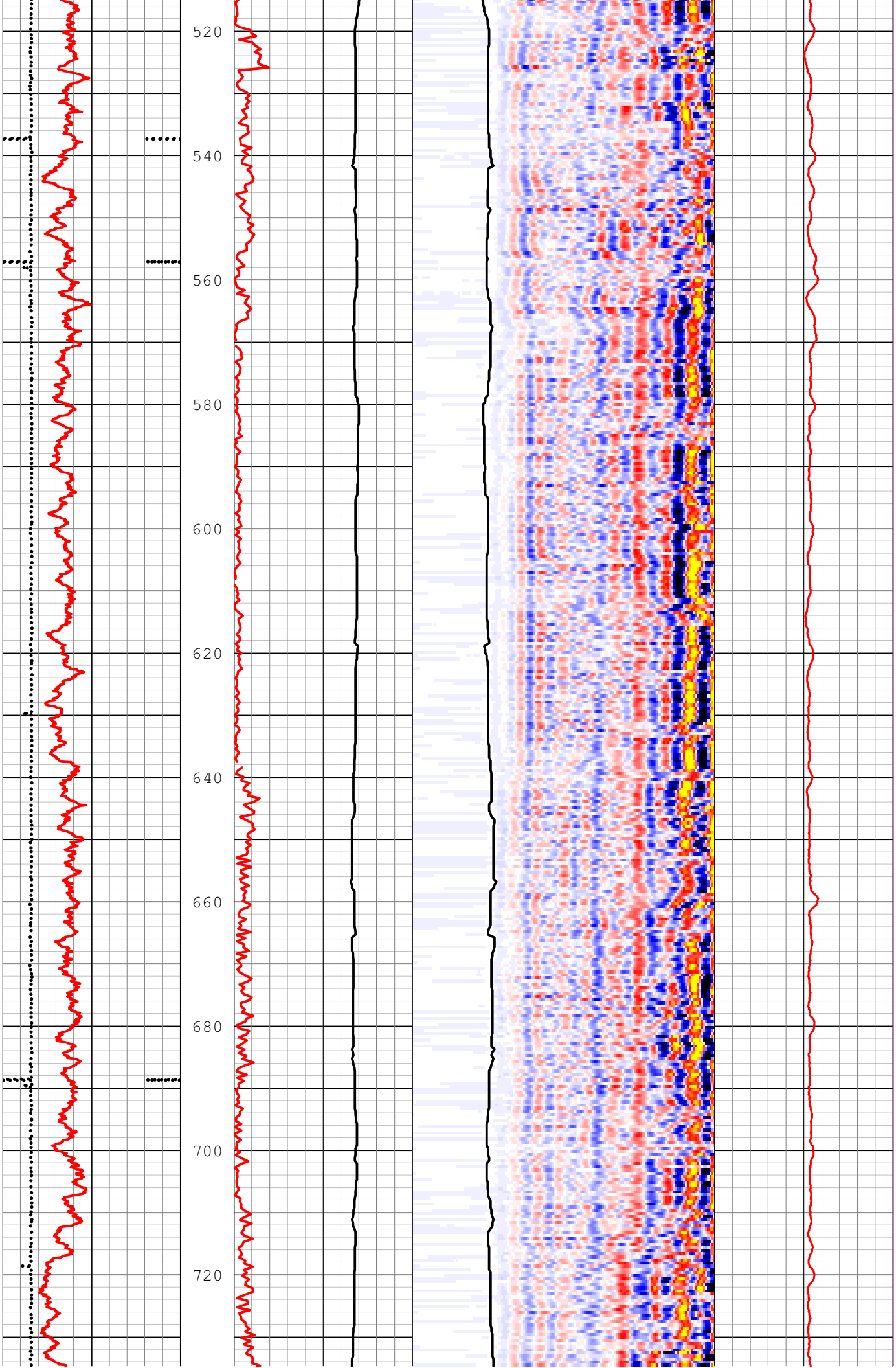
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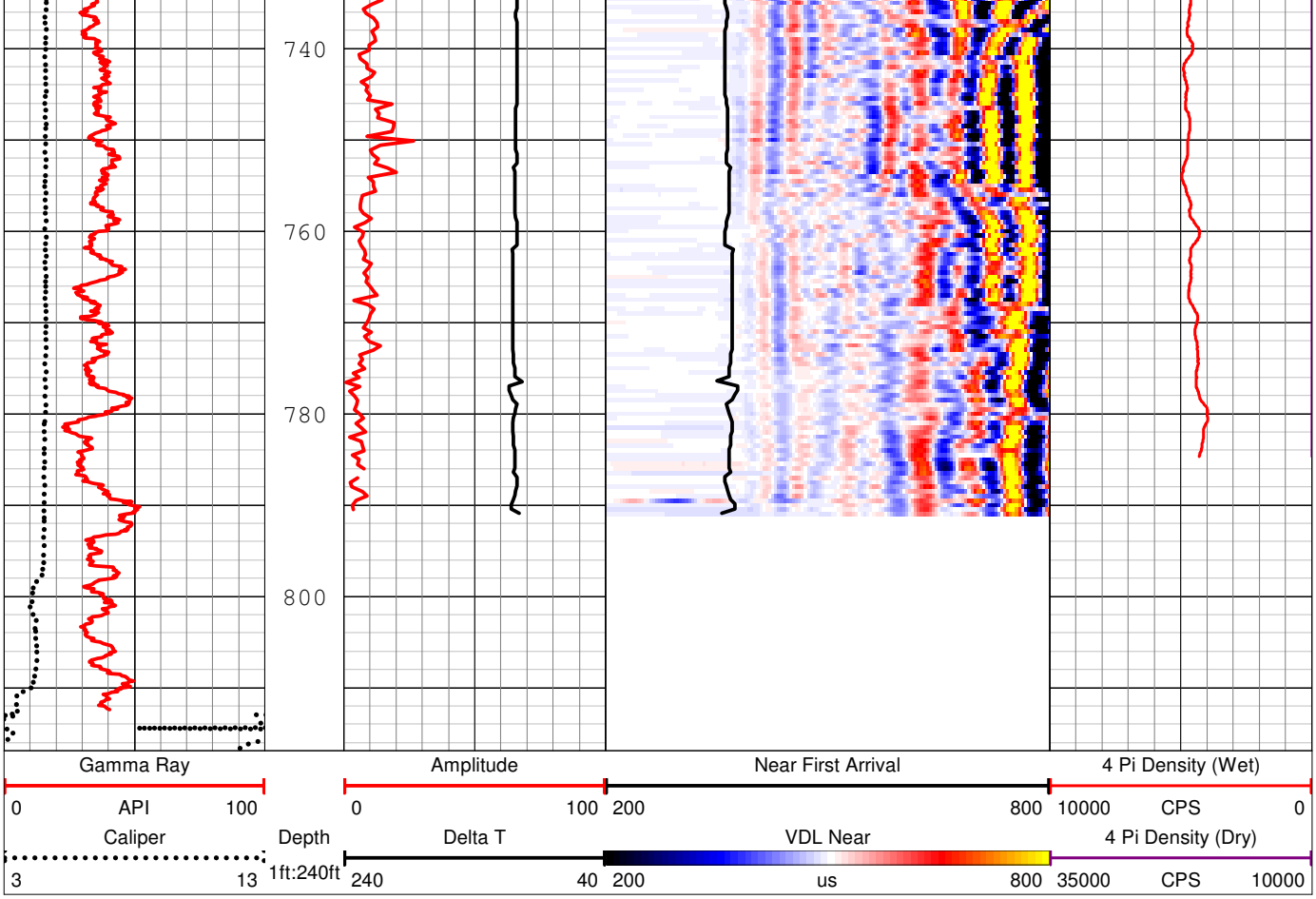
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Caliper
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Amplitude
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Delta T
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40
Near First Arrival
200
800
VDL Near
200
us
800
4 Pi Density (Wet)
10000
CPS
0
4 Pi Density (Dry)
35000
CPS
10000