Applied Technology Services
Welding and NDE Services Group
3400 Crow Canyon Rd
San Ramon, CA. 94583

PG&E Confidential

Final Report

Pipe Characterization and Weld Assessment
San Carlos
Line 147
Mile Post 0.52

ATS Report #: 413.61-13.390

Gas Project: ICDA

Line 147 Mile Point 0.52 San Carlos

Prepared by:

Redacted
Engineering Technician II
Welding & NDE Services

Reviewed by:

Redacted
Senior Program Manager
Welding & NDE Services

Redacted

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Sections

1.0 Objectives:

The NDE Services Group of PG&E's Applied Technology Services (ATS) Division was requested to perform Radiography on the bottom 180° of the exposed section of pipe to look for any internal corrosion, pitting, and debris. Radiograph the 6" drip pot and 2"pipe between drip pot and valve to look for any liquids, or debris. Perform 12 point UT thickness surveys every foot on the 24" main line. Perform 12 point UT thickness surveys every 4" on the drip pot including the cap. Perform UT thickness surveys on the 2" piping between the drip pot and valve.

Mears performed a partial H-Form wich is attached to to the end of this report.

2.0 Results:

Line 147 Mile Point 0.52 San Carlos

Radiography Results:

Main Line: ATS Radiographed from 3:00 to 9:00 the entire 8' exposed section of 24" pipe. No sign of internal corrosion, pitting, or debris were found. The 24" section of pipe has external corrosion cells on and around the reinforcement pad for the drip pot.

6" Drip Pot: ATS radiographed the drip pot and found it to be full of debris / sludge. Drip pot also has heavy external corrosion.

2" pipe between drip pot and valve: The 2" pipe is full of debris / sludge

2" Elbow past valve and 2" pipe running vertical: The bottom elbow has debris / sludge that stops at the first girth weld running vertical. The vertical section of pipe has no debris / sludge. The top elbow has a small buildup of debris / sludge on the bottom.

Line 147 Mile Point 0.52 San Carlos

Ultrasonic thickness surveys results:

24" Main line: The thickness readings are Maximum 0.340", Minimum 0.317", Average 0.329".

6" Drip pot: The thickness readings are Maximum 0.303", Minimum 0.250", Average 0.280".

Side of cap on drip pot: The thickness readings are Maximum 0.486", Minimum 0.431", Average 0.455".

Bottom of cap on drip pot: The thickness readings are Maximum 0.497", Minimum 0.436", Average 0.474".

2" pipe between drip pot and valve: The thickness readings are Maximum 0.169", Minimum 0.146", Average 0.158".

Line 147 Mile Point 0.52 San Carlos

External corrosion survey results

Component 1 24" Main line results: 8.00' Straight Pipe Component X 24" O.D.

EC-1: Average Wall Thickness: 0.325", Min. 0.244" for 25% Wall Loss.

EC-2 : Average Wall Thickness: 0.325", Min. 0.283" for 13% Wall Loss.

Component 2 Drip pot and 2" pipe between drip pot and valve

Drip Pot: 6.76" O.D. X 13.00" Long, with a 3.00" Cap on bottom of Drip Pot
2" pipe between drip pot and valve: 5.00" Straight pipe from start of Drip line to the 2.00" Valve

Note- the following Pipe Sections did not have any external corrosion
- 2.00" Stop Valve
- 90° Elbow going Up
- Straight Pipe
- 90° Elbow
- Release Cap Valve

Component 2 Results: Drip Pot

EC-3: Average Wall Thickness: 0.280", Min. 0.138" for 50.69% Wall Loss, (Per Laser Scanner see attached Report). an Impression Casting of the corroded weld, drip pot to saddle weld was difficult to obtain using multiple methods. This was: 4.00" width X 0.800" Long and approximately 0.150"-0.200" metal loss.

EC-3-3: Average Wall Thickness: 0.280", Min. 0.207" for 26.1% Wall Loss.

3.0 Supporting Documents:

Refer to Attachments for photographs, radiographs, and detailed results.

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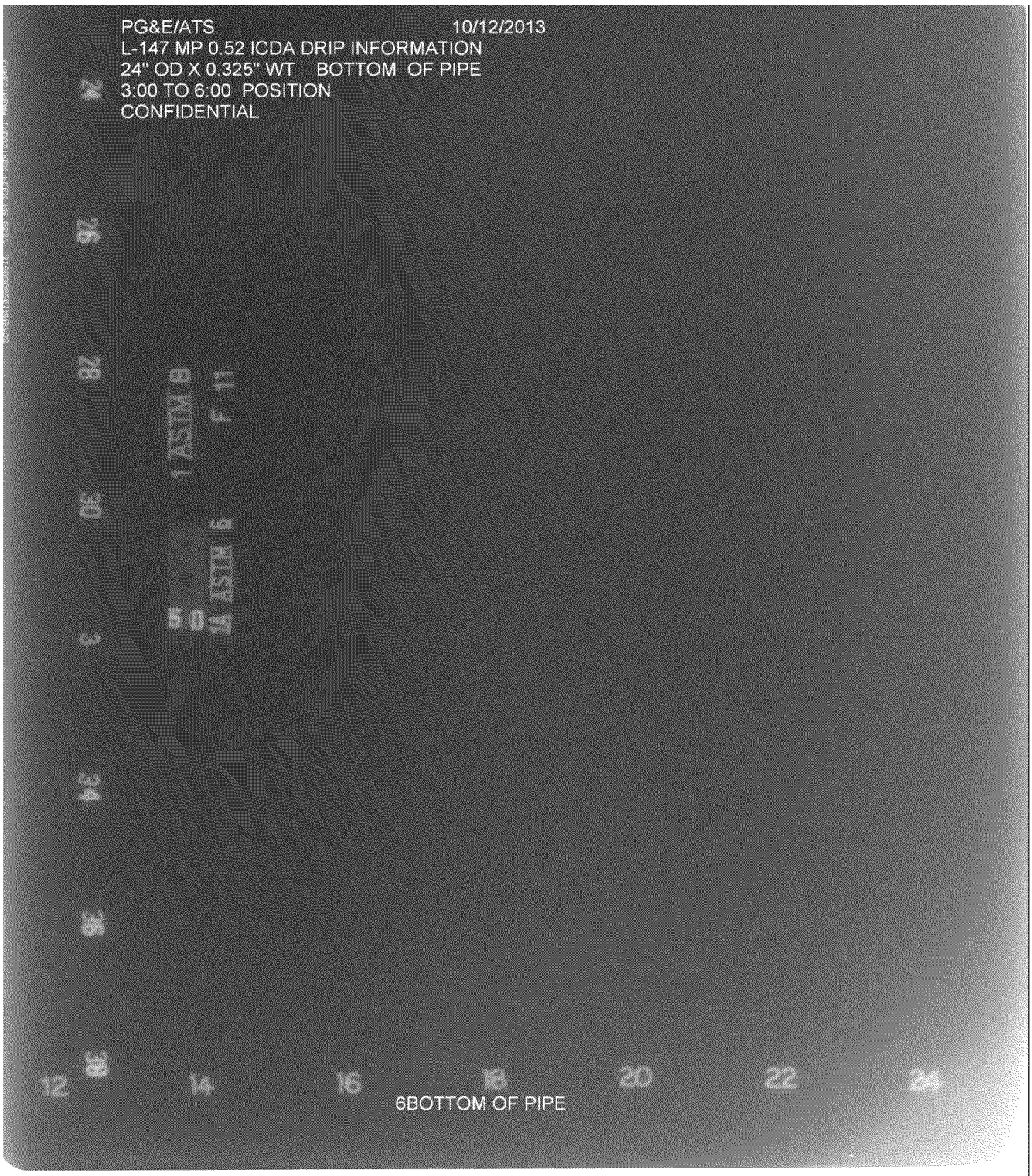
Attachment A

Line 147 Mile Point 0.52 San Carlos

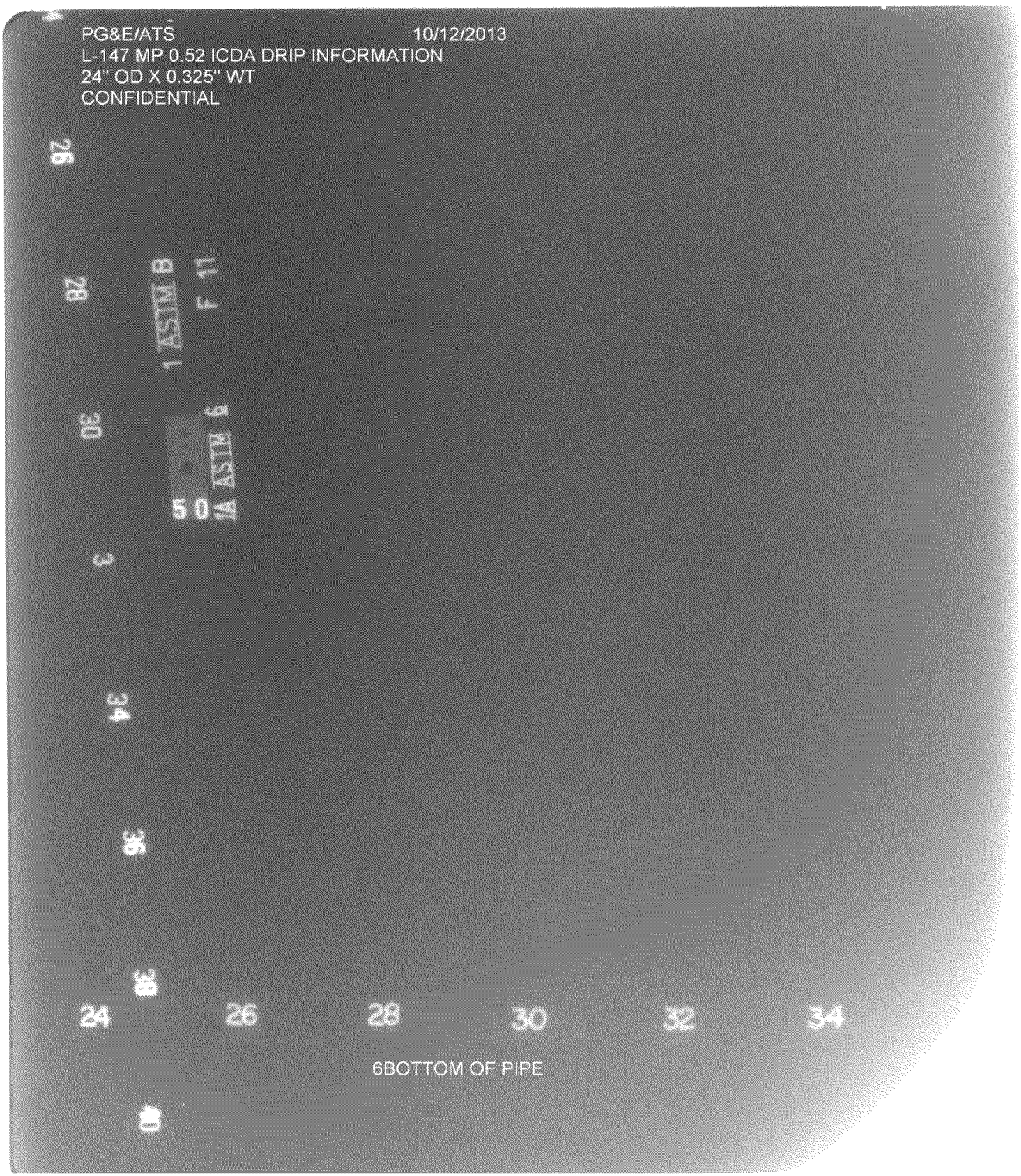
Performed radiography on the bottom 180° of the exposed section of pipe to look for any internal corrosion, pitting, and debris. Radiograph the 6" drip pot and 2"pipe between drip pot and valve to look for any liquids, or debris.

Radiograph of the 24" main line showing no internal corrosion



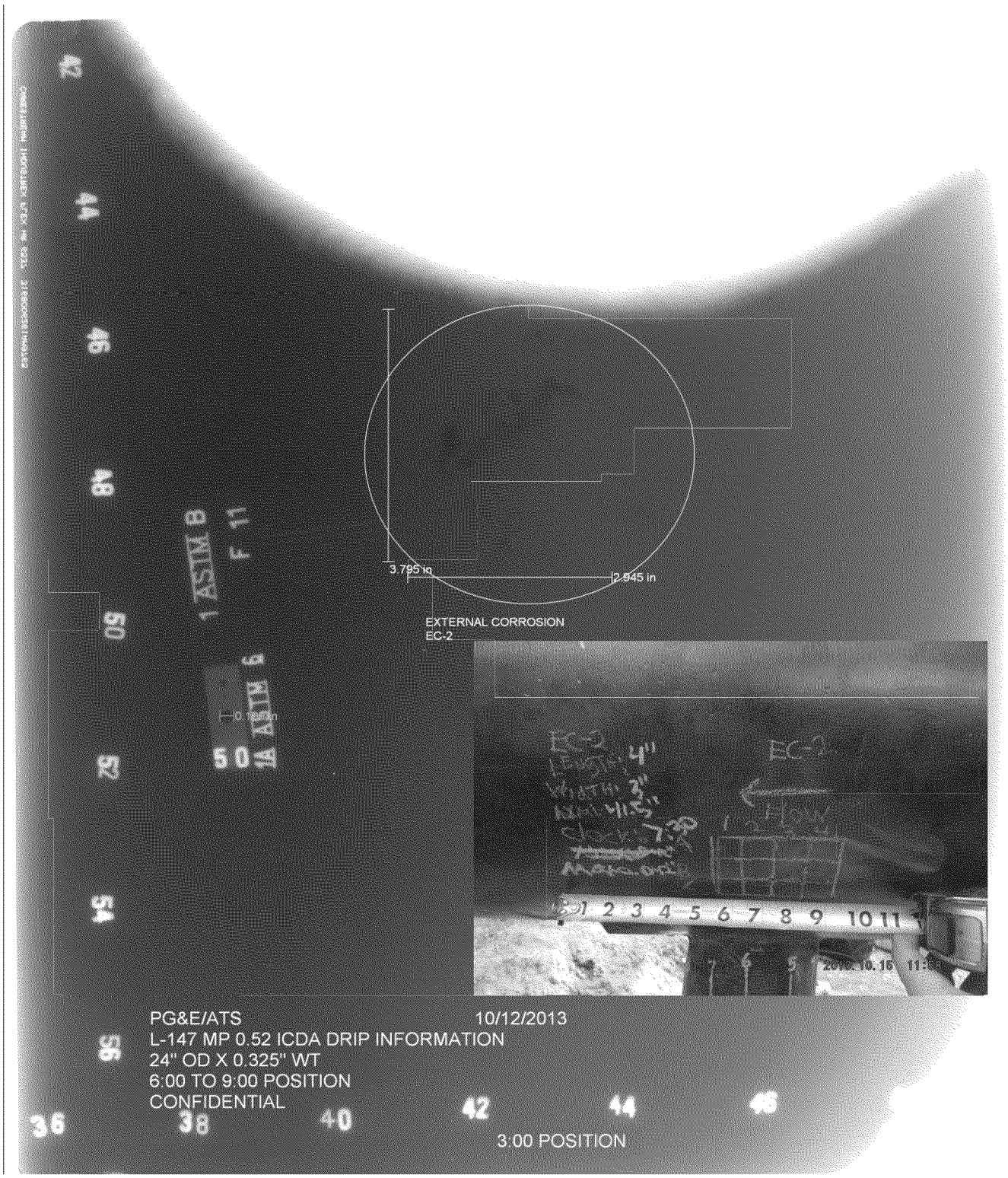
SB_GT&S_0467587

Radiograph of the 24" main line showing no internal corrosion

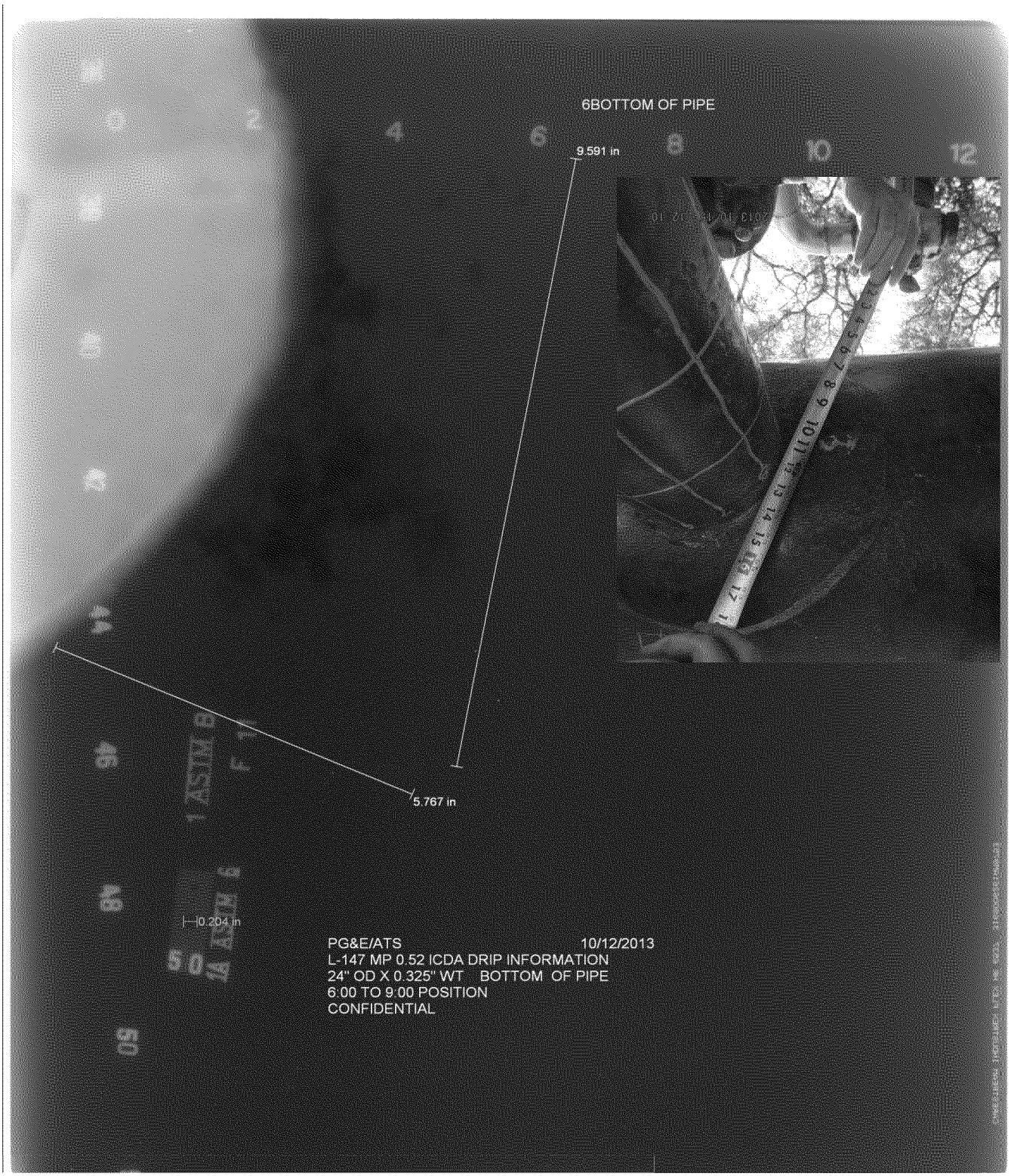


Radiograph of the 24" main line showing external corrosion cell (EC-1)

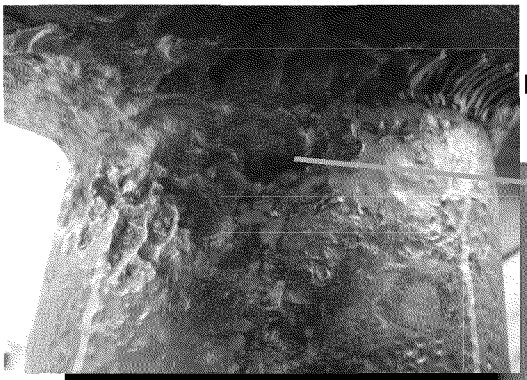
Radiograph of the 24" main line showing external corrosion cell (EC-2)



Radiograph of the 24" main line showing external corrosion cell (EC-3-1)

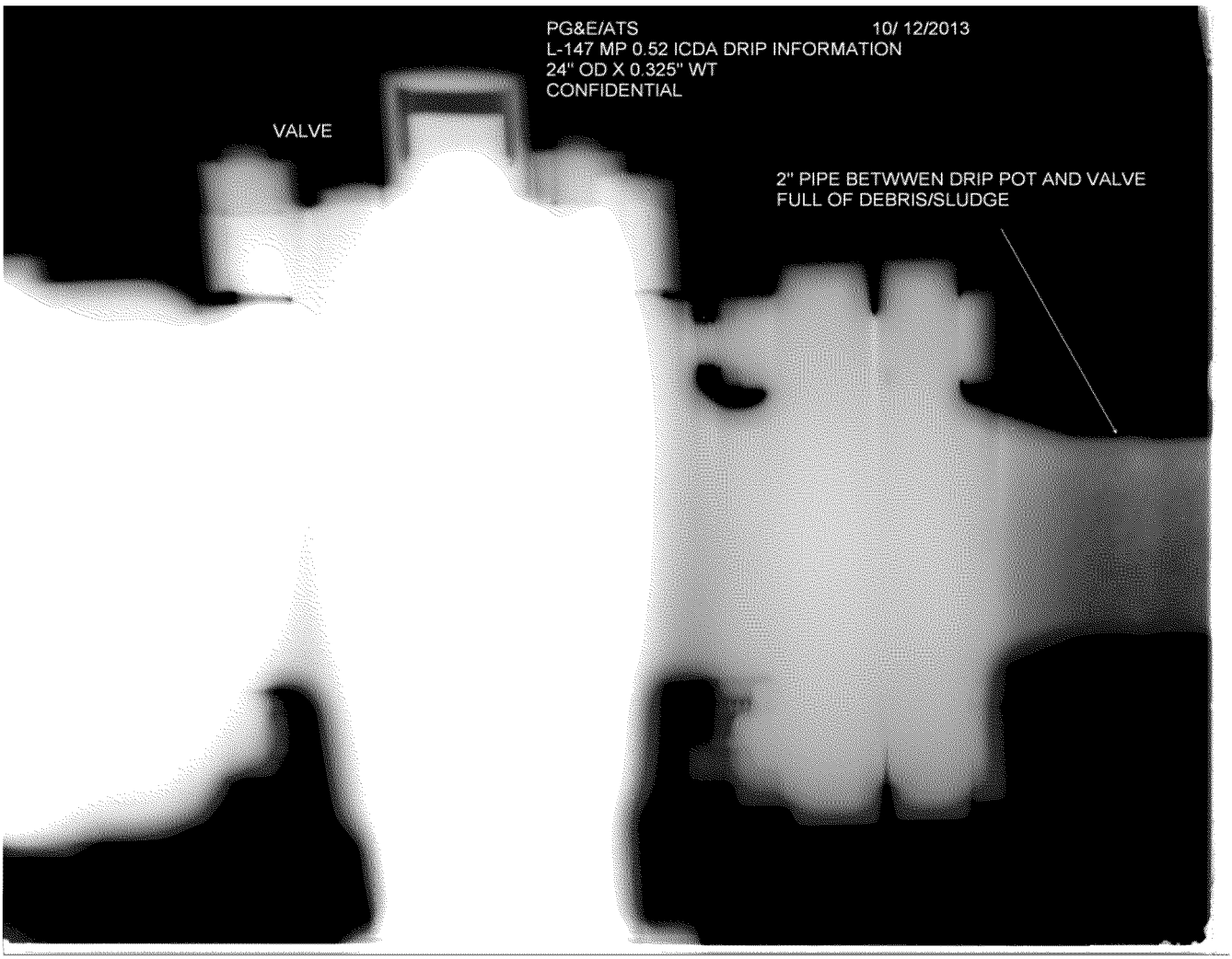


Radiograph of the Drip Pot showing debris / sludge inside of the drip pot and 2" pipe between the drip pot and valve.



Picture showing the external corrosion

Radiograph of the 2" pipe between the drip pot and valve in the 90° position



Radiograph of the 2" piping past the vavle showing debris / slugde in the bottom 90 and a small amount of debris / sludge on the bottom of the upper 90

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UT Thickness Report

Work Location and Details

Component & Item:	Line 147 Mile Point 0.52 San Carlos 0				
City:	San Carlos	GPS Lat / Long	Redacted		
Line:	147	Mile Post:	0.52	Date of Examination:	October 11, 2013

Inspection Parameters

Thickness Meter / Model:	Panametrics MG-X2			Serial No.:	110928710
Range (Inches):	1"	Velocity (In /usec):	2334	Gain (dB):	42
Transducer Make / Model:	Panametrics D790 SM	☐ Scan ☑ Spo		Serial No.:	785207
Size / Dia (Inches)	0.312"	Frequency (mHz):	5	Element:	Dual
Calibration Block Info:	C/S .100" - .250" 12-3708				

Echo-To-Echo Feature:	Method:	Calibration:	Time:
Off		In	16:00
		Out	20:00

Couplant:	UT-X Couplant	Batch No.:	11163E	Temperature °F:	Ambient
Procedure No. / Rev.:	ATS-UT-300 (C/S Pipe / Comp)			Acceptance:	For Client Information

Component Details

Size / Dia:	24	Circumference:	75.40	Nominal Thickness:	See Below
Surface Finish:	Wire Wheeled	Long Seam Clock Pos.:	2:00	Average Thickness:	See Below

Comments: N/A

Examiner	Redacted	Level:	II	Title:	Senior Engineering Technician	Date:	10/11/2013

UT Thickness Report

24" Header: Exposed 4' either side of drip, 360-degrees, 8' total.
Performed 12 point UT thickness readings every foot.

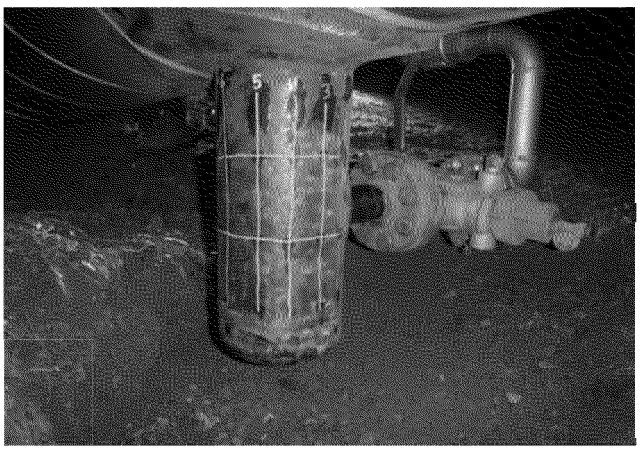
	0'	1'	2'	3'	4'	5'	6'	7'	8'
12:00	0.332	0.337	0.323	0.334	0.332	0.330	0.330	0.330	0.328
1:00	0.323	0.327	0.325	0.325	0.324	0.322	0.320	0.320	0.319
2:00	0.325	0.321	0.321	0.324	0.323	0.318	0.317	0.318	0.319
3:00	0.321	0.323	0.322	0.324	0.324	0.317	0.319	0.320	0.319
4:00	0.328	0.332	0.330	0.331	0.325	0.326	0.326	0.331	0.327
5:00	0.336	0.338	0.337	0.336	0.331	0.334	0.332	0.332	0.327
6:00	0.333	0.335	0.332	0.331	0.331	0.329	0.331	0.328	0.327
7:00	0.331	0.331	0.331	0.330	0.328	0.330	0.328	0.328	0.325
8:00	0.333	0.332	0.334	0.335	0.330	0.331	0.331	0.327	0.326
9:00	0.333	0.333	0.333	0.334	0.329	0.333	0.330	0.329	0.329
10:00	0.334	0.334	0.336	0.340	0.331	0.331	0.332	0.330	0.328
11:00	0.337	0.337	0.337	0.337	0.335	0.336	0.334	0.333	0.330
Maximum Found:	0.337	0.338	0.337	0.340	0.335	0.336	0.334	0.333	0.330
Minimum Found:	0.321	0.321	0.321	0.324	0.323	0.317	0.317	0.318	0.319
Average thickness:	0.331	0.332	0.330	0.332	0.329	0.328	0.328	0.327	0.325

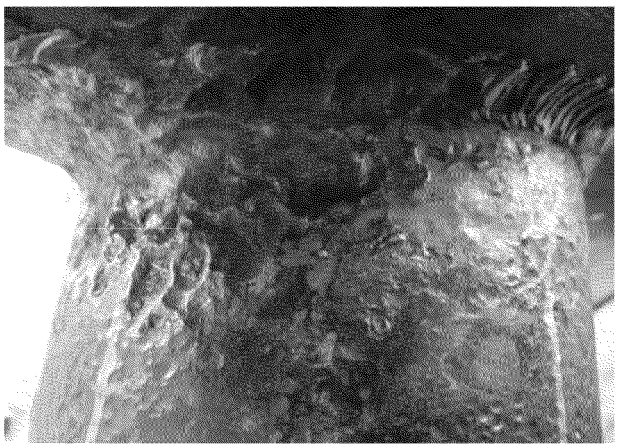
UT Thickness Report

6" Drip pot and end cap UT thickness readings Readings taken at 4" increments.

	0"	4"	8"	12"	Side of Cap
12:00	0.293	0.282	Repad	0.280	0.486
1:00	0.291	0.283	Repad	0.285	0.441
2:00	0.273	0.280	0.266	0.276	0.444
3:00	0.250	0.250	0.260	0.254	0.455
4:00	0.250	0.261	0.258	0.259	0.431
5:00	0.268	0.273	0.277	0.279	0.444
6:00	0.292	0.281	0.288	0.284	0.452
7:00	0.287	0.299	0.296	0.288	0.466
8:00	0.287	0.288	0.278	0.271	0.469
9:00	0.303	0.302	0.300	0.291	0.449
10:00	0.297	0.294	0.288	0.278	0.469
11:00	0.285	0.292	Repad	0.274	0.457

Maximum Found:	0.303	0.302	0.300	0.291	0.486
Minimum Found:	0.250	0.250	0.258	0.254	0.431
Average thickness:	0.281	0.282	0.279	0.277	0.455





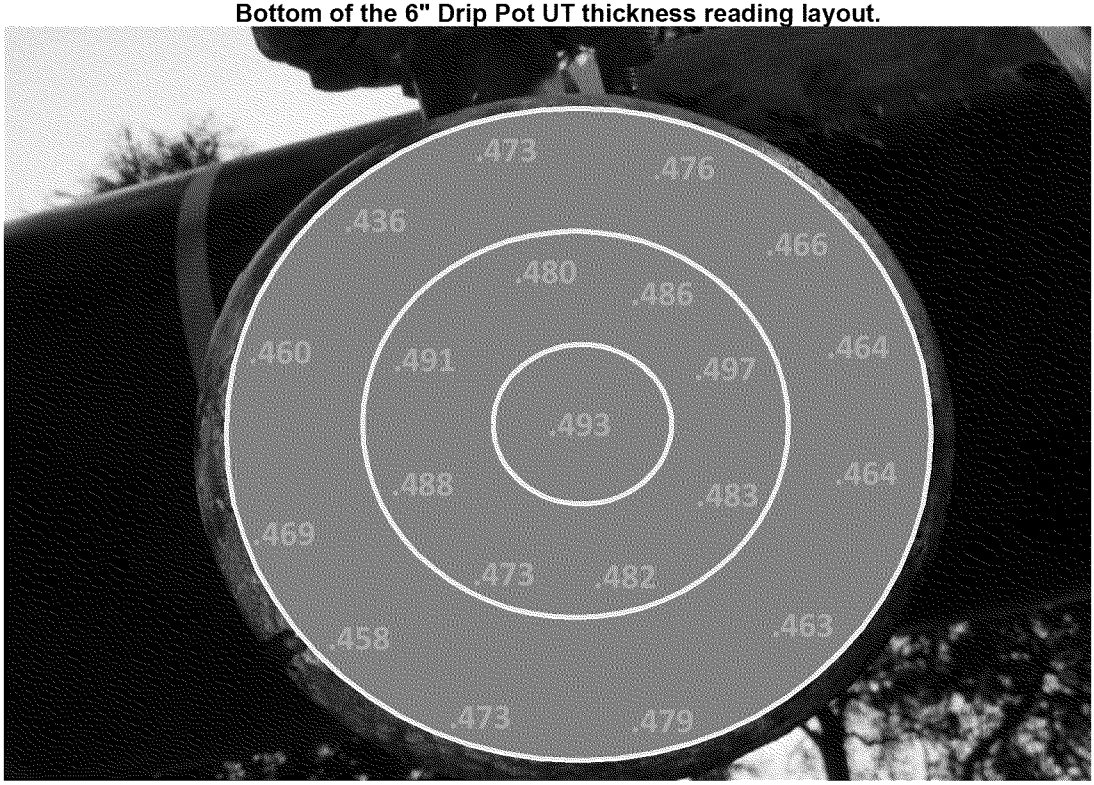
EC 3-1 UT thickness survey of corrosion cell between the reinforcment pad and the drip pot using a pencil probe.

Position	UT reading	Remaining wall
7:00	0.162	42.14%
plus 1"	0.179	36.07%
8:00	0.216	22.85%
plus 1"	0.185	33.92%
9:00	0.160	42.85%
Average wall thickness for the drip pot:		0.280

Equipment: Epoch 4 S/N 21417606
Transducer: Panamentrics Sonopen
V260 RM 15/125 S/N 164310
Velocity: 0.2346
Range: 1.00"
Decables: 58.5
Step Wedge: Panametrics 2214E
1018 Steel S/N 8840
Performed by Redacted

UT Thickness Report

Bottom of the 6" Drip Pot UT thickness reading layout.



Outer Ring Clockwise	0.473
	0.476
	0.466
	0.464
	0.464
	0.463
	0.479
	0.473
	0.458
	0.469
	0.460
	0.436
	0.480
Inner ring going clockwise	0.486
	0.497
	0.483
	0.482
	0.473
	0.488
	0.491
Center	0.493

Maximum Found:	0.497
Minimum Found:	0.436
Average thickness:	0.474

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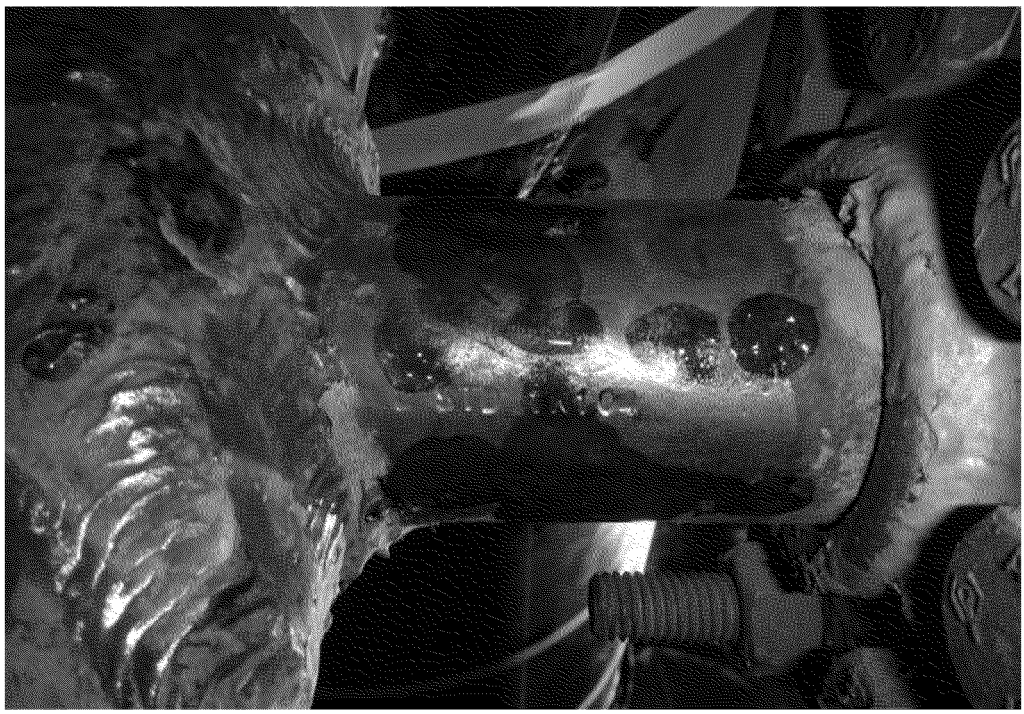
UT Thickness Report

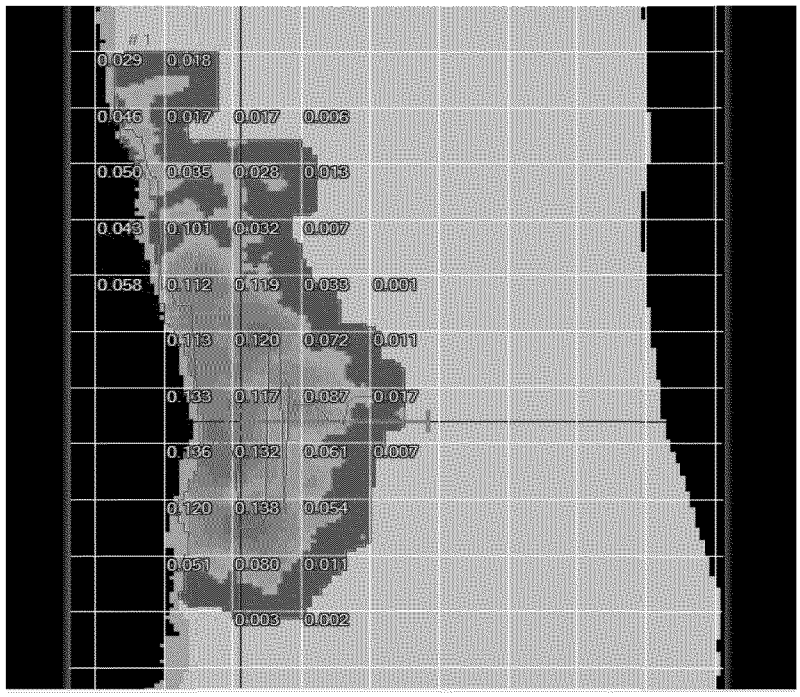
2" pipe between drip pot and valve.

	12 top	1:30	3:00 North	4:30	6:00 Bottom	7:30	9:00 South	10:30
Loc 1	0.158	0.165	0.156	0.166	0.146	0.160	0.158	0.160
Loc 2	0.162	0.162	0.158	0.169	0.163	0.153	0.160	0.159
Loc 3	0.157	0.158	0.162	0.153	0.148	0.150	0.166	0.149
Loc 4	0.156	0.157	0.158	0.161	0.155	0.160	0.168	0.152
Maximum Found:	0.162	0.165	0.162	0.169	0.163	0.160	0.168	0.160
Minimum Found:	0.156	0.157	0.156	0.153	0.146	0.150	0.158	0.149
Average thickness:	0.158	0.161	0.159	0.162	0.153	0.156	0.163	0.155



Creaform Laser Scanner Data for Drip Pot EC-3

Inspection Overview:



Scan Date	Tuesday, October 15, 2013 6:19 PM	
Report Creation Date	Tuesday, October 15, 2013 7:18 PM	
Pipe Owner	Pacific Gas and Electric	
Pipe Name	L-147 MP 0.52	
Technician Name	Redacted	
Inspector Name		
Number of Features Found		
Scan Resolution	0.039	in
Nominal Pipe Diameter	6.650	in
Pipe Wall Thickness	0.280	in
Analyzed Surface	Outer Surface	

Creaform Laser Scanner Data for Drip Pot EC-3

Pit-Gauge Parameters:

Center Length	3.000	in	Extension	6.000	in
Minimum Ext.	0		Maximum Ext.	5	
Symmetric?					

Flow Stress Parameters:

SMYS		psi
Material	Plain Carbon Steel	
Temperature		°F
S_{ut}	0.000	psi
S_{yt}	0.000	psi
S_{flow} B31G		psi (Method 1)
S_{flow} Modif. B31G		psi (Method 1)
S_{flow} Eff. Area		psi (Method 1)
Design Factor	1	
MAOP		psi

Interaction Parameters:

Axial Criteria		in
Circumferential Criteria		in
Critical Factor		%
Threshold		
Method	Fit To Shape	
Filter	None	
MOP		psi

Inspection Zone :

Worst Case Profile Resolution	0.039	in
Absolute Axial Position of Reference	0.000	in
Absolute Circ. Position of Reference	0.000	°
Comment		

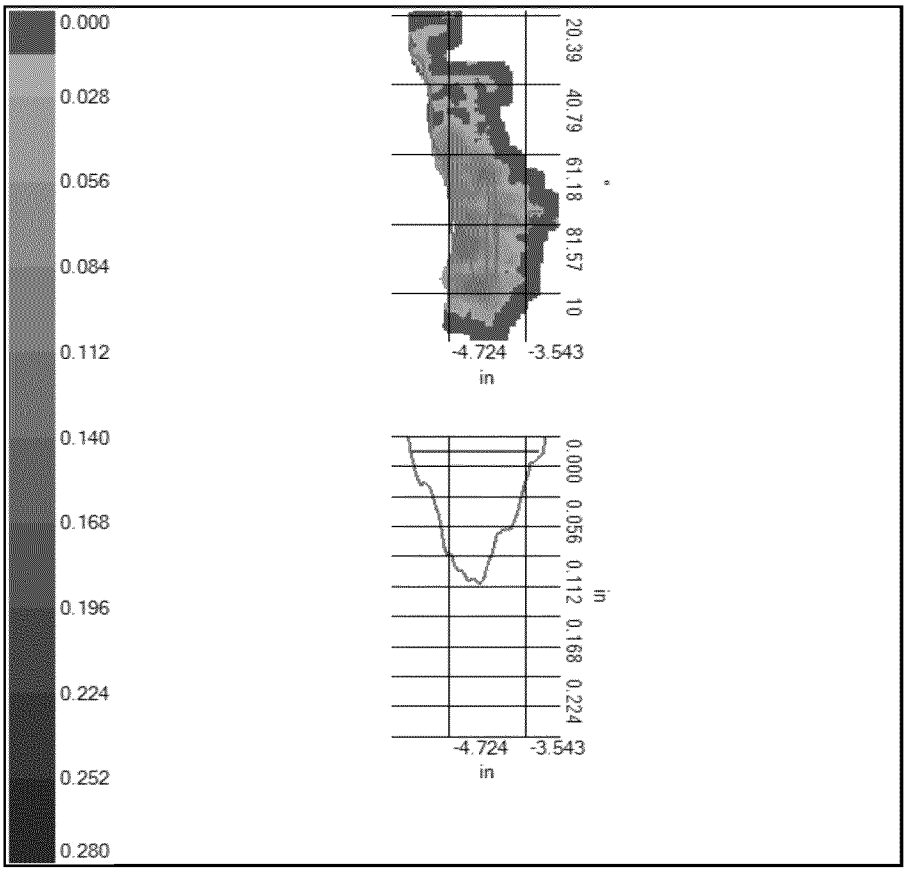
Features Summary:

Feature ID	Axial Start	Circ. Start	Max. Depth
			% Rem. Wall
	in	°	in
Feature 1	-5.354	23.09	0.138
			50.698

Creaform Laser Scanner Data for Drip Pot EC-3

Results for Feature 1

Axial Start	-5.354	in
Axial End	-3.268	in
Axial Length	2.087	in
Circ. Start	23.090	°
Circ. End	111.400	°
Circ. Length	88.300	°
Max. Depth	0.138	in
Axial Pos.	-4.272	in
Circ. Pos.	100.190	°



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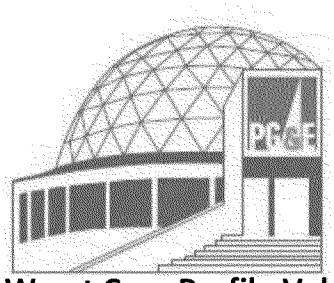
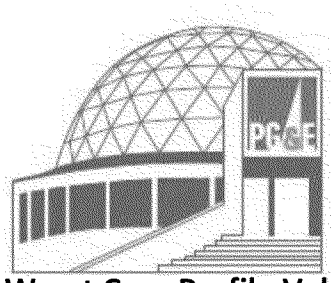


Creaform Laser Scanner Data for Drip Pot EC-3

Worst Case Profile Values for Feature 1

Axial (in)	Circ. (°)	Depth (in)	Depth (%)	RWT (in)	RWT (%)	Pit Gauge
-5.394	25.830	0.000	0.000	0.280	100.000	
-5.354	25.830	0.016	5.873	0.264	94.127	
-5.315	31.950	0.025	8.909	0.255	91.091	
-5.276	31.950	0.035	12.375	0.245	87.625	
-5.236	31.950	0.041	14.740	0.239	85.260	
-5.197	33.310	0.046	16.429	0.234	83.571	
-5.158	33.310	0.042	15.043	0.238	84.957	
-5.118	38.070	0.044	15.723	0.236	84.277	
-5.079	40.110	0.046	16.546	0.234	83.454	
-5.039	40.110	0.050	17.932	0.230	82.068	
-5.000	59.140	0.058	20.846	0.222	79.154	
-4.961	58.460	0.067	23.988	0.213	76.012	
-4.921	59.820	0.073	26.089	0.207	73.911	
-4.882	61.860	0.087	30.979	0.193	69.021	
-4.843	61.860	0.102	36.551	0.178	63.449	
-4.803	61.860	0.109	38.863	0.171	61.137	
-4.764	61.860	0.110	39.316	0.170	60.684	
-4.724	75.450	0.110	39.214	0.170	60.786	
-4.685	87.690	0.119	42.584	0.161	57.416	
-4.646	85.650	0.124	44.166	0.156	55.834	
-4.606	86.330	0.126	44.943	0.154	55.057	
-4.567	84.290	0.124	44.423	0.156	55.577	
-4.528	85.650	0.129	45.917	0.151	54.083	
-4.488	84.970	0.133	47.461	0.147	52.539	
-4.449	85.650	0.136	48.436	0.144	51.564	
-4.409	89.050	0.132	47.066	0.148	52.934	
-4.370	99.930	0.133	47.648	0.147	52.352	
-4.331	99.930	0.136	48.475	0.144	51.525	
-4.291	99.930	0.138	49.302	0.142	50.698	

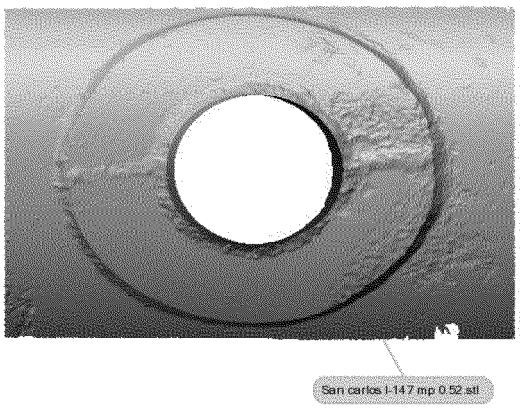


Creaform Laser Scanner Data for Drip Pot EC-3

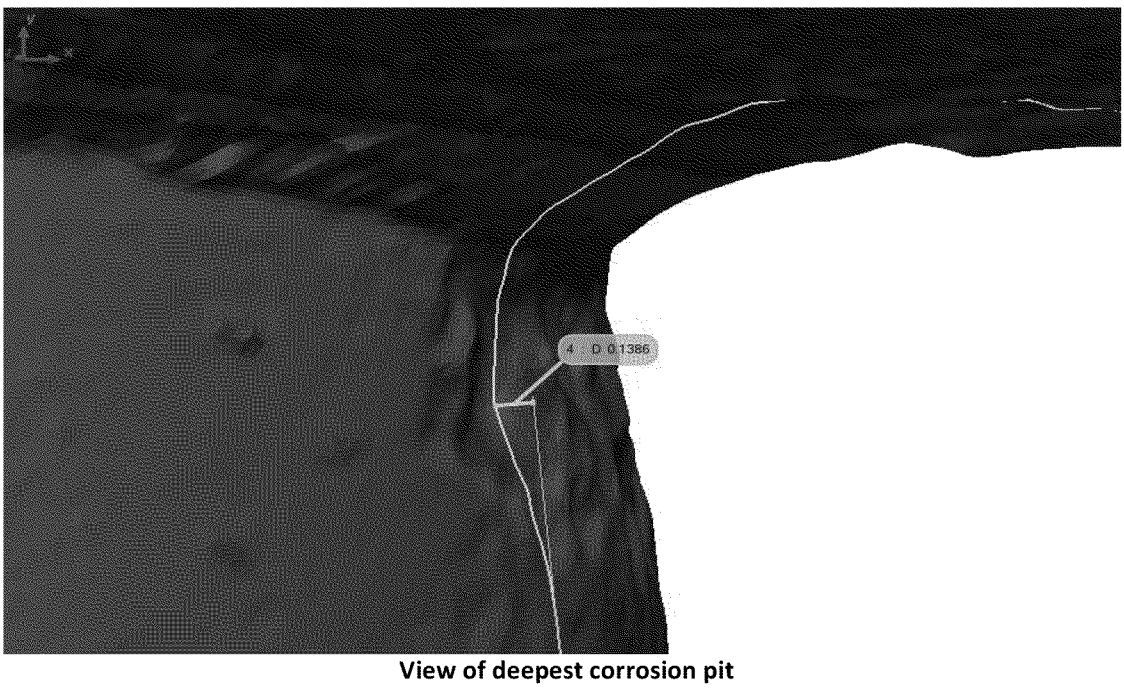
Worst Case Profile Values for Feature 1 Continued

Axial (in)	Circ. (°)	Depth (in)	Depth (%)	RWT (in)	RWT (%)	Pit Gauge
-4.252	99.930	0.136	48.541	0.144	51.459	
-4.213	99.250	0.130	46.481	0.150	53.519	
-4.173	99.250	0.121	43.144	0.159	56.856	
-4.134	65.940	0.114	40.761	0.166	59.239	
-4.095	66.620	0.109	38.975	0.171	61.025	
-4.055	66.620	0.099	35.460	0.181	64.540	
-4.016	97.210	0.090	32.173	0.190	67.827	
-3.976	75.450	0.090	32.248	0.190	67.752	
-3.937	78.850	0.087	31.112	0.193	68.888	
-3.898	78.850	0.087	30.977	0.193	69.023	
-3.858	78.850	0.086	30.614	0.194	69.386	
-3.819	78.850	0.087	31.099	0.193	68.901	
-3.780	78.850	0.083	29.476	0.198	70.524	
-3.740	79.530	0.077	27.411	0.203	72.589	
-3.701	80.210	0.071	25.289	0.209	74.711	
-3.661	81.570	0.060	21.304	0.220	78.696	
-3.622	81.570	0.051	18.207	0.229	81.793	
-3.583	81.570	0.042	15.110	0.238	84.890	
-3.543	82.250	0.036	12.917	0.244	87.083	
-3.504	78.170	0.025	8.888	0.255	91.112	
-3.465	77.490	0.025	8.764	0.256	91.236	
-3.425	77.490	0.023	8.022	0.258	91.978	
-3.386	77.490	0.020	7.281	0.260	92.719	
-3.347	77.490	0.018	6.367	0.262	93.633	
-3.307	77.490	0.016	5.650	0.264	94.350	
-3.268	77.490	0.000	0.000	0.280	100.000	

Creaform Laser Scanner Data for Drip Pot to saddle weld

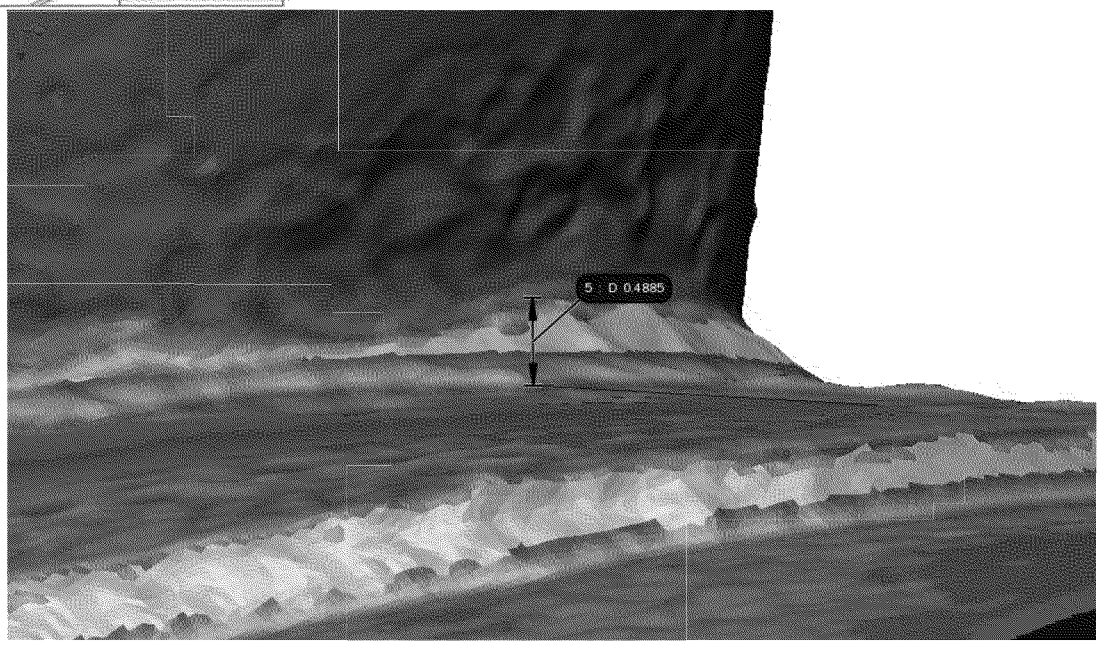


Over View of L-147 MP 0.52 drip pot and weld pad

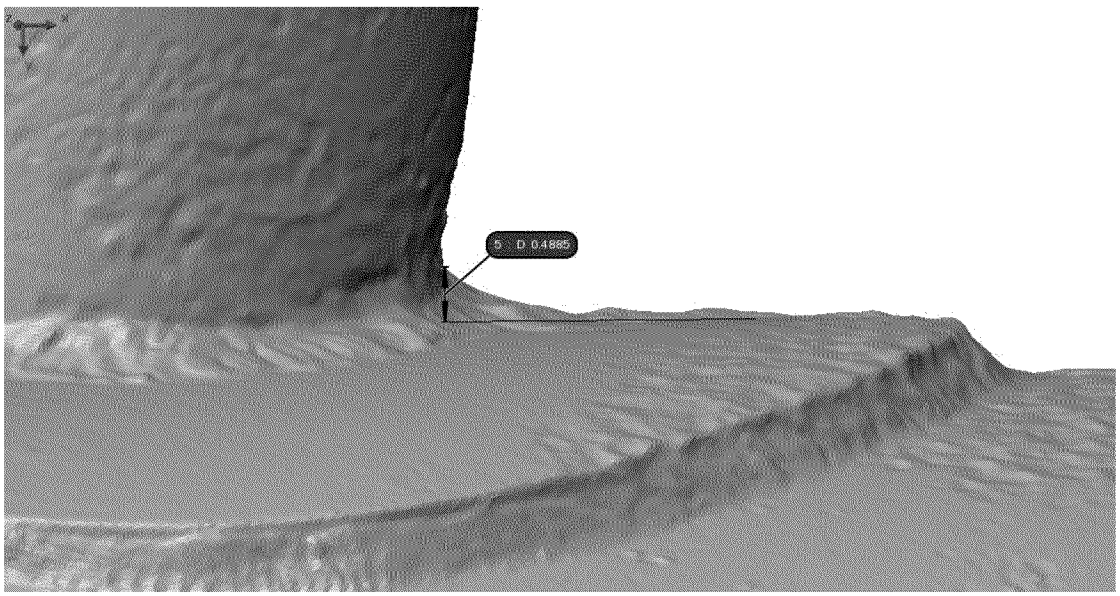


View of deepest corrosion pit

Creaform Laser Scanner Data for Drip Pot to saddle weld

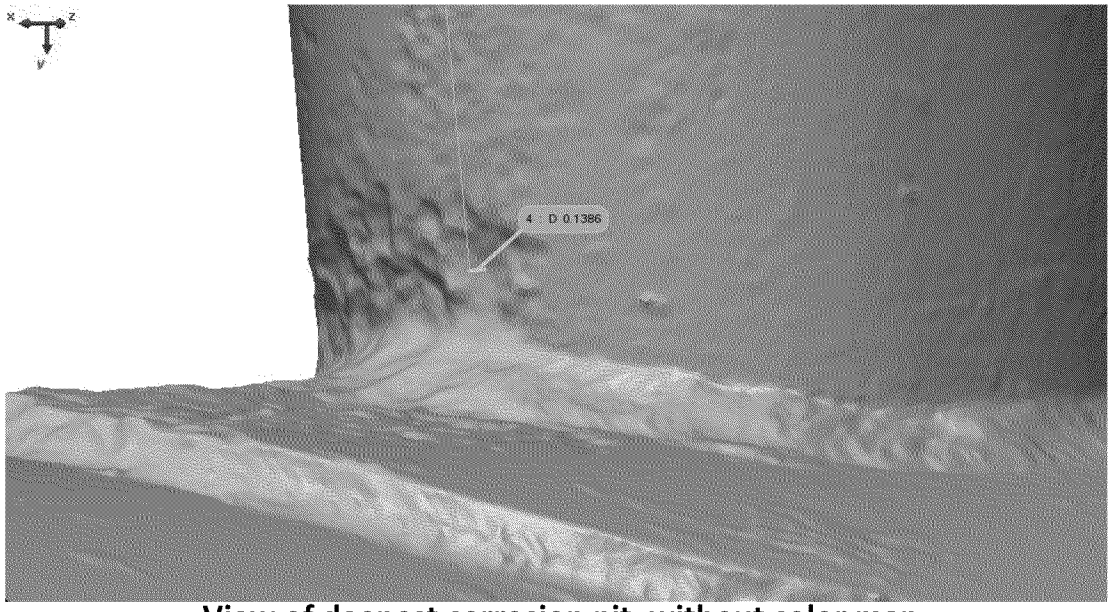


Estimated weld leg size



Estimated weld leg size, without color map

Creaform Laser Scanner Data for Drip Pot to saddle weld



View of deepest corrosion pit, without color map

Cross-section view of estimated weld leg size

Form H: Direct Examination Data Sheet - Page 1 of 10

DA/ILI		DA		ILI	
Route Number:	L-147	**N-Segment:**	L-147	**ILI Log Distance:**	N/A
Examination Date:	10/15/2013	**IMA Number:**	N/A	**RMP-11 Ref. Section:**	N/A
Mile Point:	0.52		N/A	**Reference Girth Weld:**	N/A
Examination Performed By	Redacted	**Region Number:**		**Distance From Girth Weld:**	N/A
PG&E Project Manager		**Subregion# (ICDA):**			
Approved By		**Stationing:**	N/A		
Order Number:	4151987				

Excavation Priority: ☐ Immediate ☐ Scheduled ☐ 1 Year ☐ Other ☐ Monitor ☐ Effectiveness ■ ICDA

Excavation Reason ☐ ECDA ☐ ILI ☐ Recoat ■ ICDA ☐ Other N/A

If practical, take P/S or CIS reads before excavation: N/A

Excavation Details: Centerline on GPS Coordinates (Based on GIS):

Northing: N/A
Easting: N/A

Planned Inspection Length (Ft.): 8'
Actual Inspection Length (Ft.): 8'

Centerline on GPS Coordinates (Uncorrected Field Measurement):

Northing: 4147701.664 m
Easting: 562906.949 m

GPS File Name: L-147 MP 0_52

Centerline on GPS Coordinates (Corrected Field Measurement):

Northing:
Easting:

Nominal Wall Thickness: .312"
Nominal Pipe Diameter: 24"

1.0 Data Before Coating Removal

1.1 Native Soil Type: ☐ Clay ☐ Rock ☐ Sand ■ Loam ☐ Wet ☐ Other

1.1a Backfill Material Found ☐ Sand ☐ Slurry ■ Native

Depth of Cover (Ft.): None this inpsection was done above ground

Comments: This inspection was done on a span of pipe that is exposed across a creek.

1.2 Coating Type: ■ HAA ☐ Somastic ☐ Plastic Tape ☐ Wax Tape ☐ FBE ☐ Powercrete ☐ Bare/None ☐ Paint ☐ Other: N/A

Comments: this is a thick asphalt coating.

Coating Thickness (Inches): 0.523

Number of Layers: 1

1.3 Holiday Testing Performed?: ☐ Yes ■ No Voltage Used: N/A Map Location of Holidays Below.

Device Used: ☐ Coil ☐ Wet Sponge

Comments: The coating was removed when I arrived on site.

1.4 Pipe-to-Soil Potentials in Ditch (-mV): US: 1,057 DS: 1,066

Comments: These potentials are above the Nace standard of -850 mV, these readings were taken with a CSE.

1.5 Soil Resistivity in Ditch (Ω-cm):

Method: ☐ 4-Pin 4-pin not performed ■ Soil Box 1.6X10,000=1,000

1.6 Soil Sample Location: Comments: There was no soil sample taken.

1.7 Ground Water Present?: ☐ Yes ■ No Sample(s) Collected?: ☐ Yes ■ No Sample pH: N/A

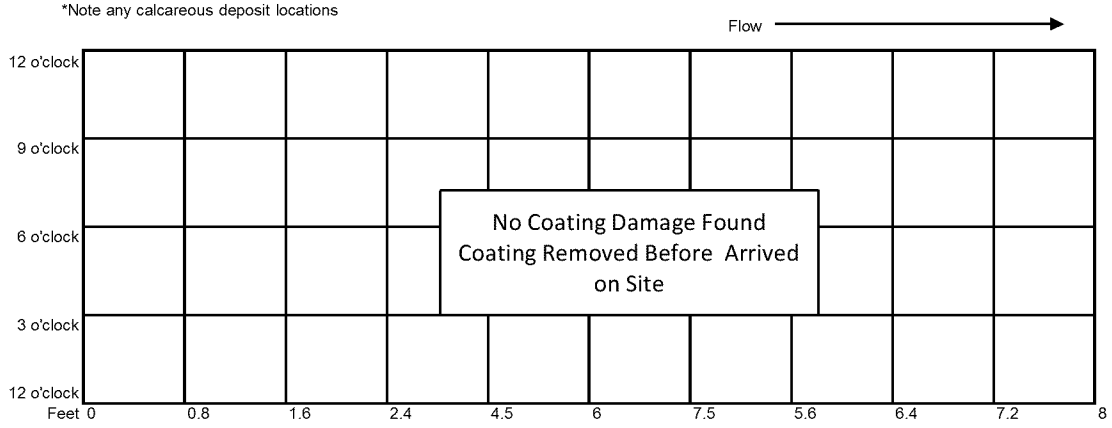
Comments:

1.8 Coating Condition: ☐ Good - Adhered to Pipe ☐ Fair - Coating Partially Disbonded or Degraded ☐ Poor - Coating Significantly Disbonded or Missing

Comments: Coating was removed before Mears Technician arrived on site 10-15-13

1.9 Map of Coating Degradation*: **Zero Reference Point:** U/S Edge of coating removal

*Note any calcareous deposit locations



DA/ILI		DA		ILI	
Route Number:	L-147	N-Segment:	L-147	ILI Log Distance:	N/A
Examination Date:	10/15/2013	IMA Number:	N/A	RMP-11 Ref. Section:	N/A
Mile Point:	0.52		N/A	Reference Girth Weld:	N/A
Examination Performed By:	Redacted	Region Number:		Distance From Girth Weld:	N/A
PG&E Project Manager:		Subregion # (ICDA):			
Approved By:		Stationing:	N/A		
Order Number:	4151987				

1.10 Photos Taken?*: ■ Yes ☐ No
*See Photo Log for additional information.

1.11 Coating Sample Taken?: ☐ Yes ■ No Location of Sample: There was no Coating sample taken at this site.

1.12 Liquid Underneath Coating?: ☐ Yes ■ No If Yes, pH of Liquid: N/A Coating was removed before arrival to site.

1.13 Corrosion Product Present?: ■ Yes ☐ No If Yes, Was Sample Taken?: ☐ Yes ■ No
Comments: The only corrosion product found was removed with a 4" angle grinder with a wire wheel.

1.14 Soil pH (Sb Electrode): Upstream: 5.5 Downstream: 5.5

2.0 Data After Coating Removal

2.1 Pipe Temperature (°F): Ambient Measured Pipe Diameter (In.): 24.11

2.2 Weld Seam Type: ☐ DSAW ■ SSAW ☐ ERW ☐ SMLS ☐ Spiral ☐ Lap ☐ Flash ☐ AO Smith ☐ If can't determine, visually perform macroetch to locate & identify type (see Table 5.7.3, Element 2.2)

2.3 Girth Weld Coordinates:
Northing: N/A
Easting: N/A
Elevation: N/A
Weld Clock Position: 2:00

2.4 Damage Found:
Corrosion Damage? ■ Yes ☐ No Mechanical Damage? ☐ Yes ■ No
Other Damage: There was no oter dmage that was found during the inspection

2.5 UT Wall Thickness Measurements: TDC: 0.332" /

Main Line / Drip Line			
1 O'clock: 0.326" /	2 O'clock: 0.321" /	3 O'clock: 0.320" /	
4 O'clock: 0.327" /	5 O'clock: 0.324" /	6 O'clock: 0.332" /	7 O'clock: 0.328" /
8 O'clock: 0.326" /	9 O'clock: 0.331" /	10 O'clock: 0.329" /	11 O'clock: 0.332" /

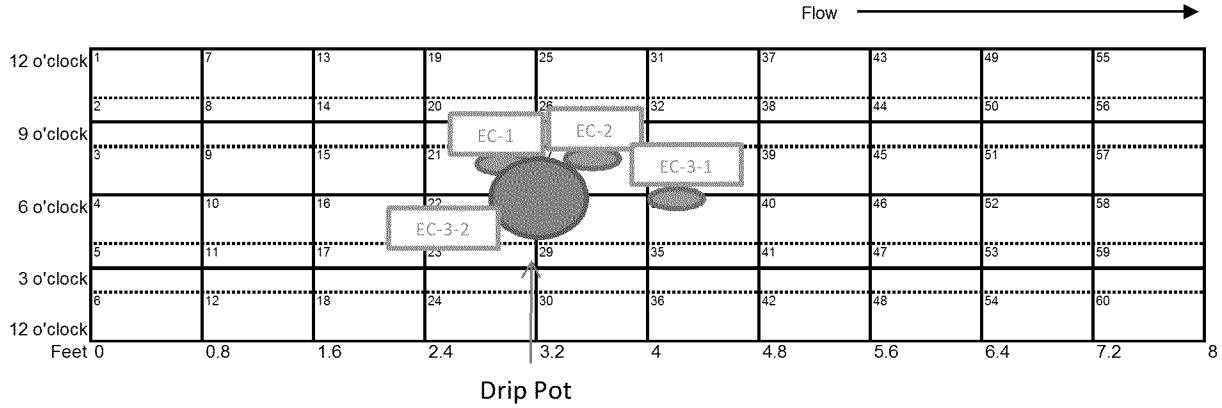
2.5a Nominal Wall Thickness: .312"

UT Wall Thickness Grid @ 6:00 is required. Be sure to attach grid to Form H electronically. See page 6 of 10.

2.6 Wet Fluorescent Mag. Part. Is Required. Comments: WFMT not performed.
Were there any linear indications? ☐ Yes ■ No If Yes, attach NDE report electronically as part of the Form H. Report to include black light and white light photos of indications.

2.7 Take Photos to Document Corrosion and Other Anomalies*
*See Photo Log for additional information.

2.8 Overview Map of Corroded Area*:
*See Pit Depth Measurement Grid for additional Information
*Note any calcareous deposits.
Zero Reference Point: U/S Edge of coating removal



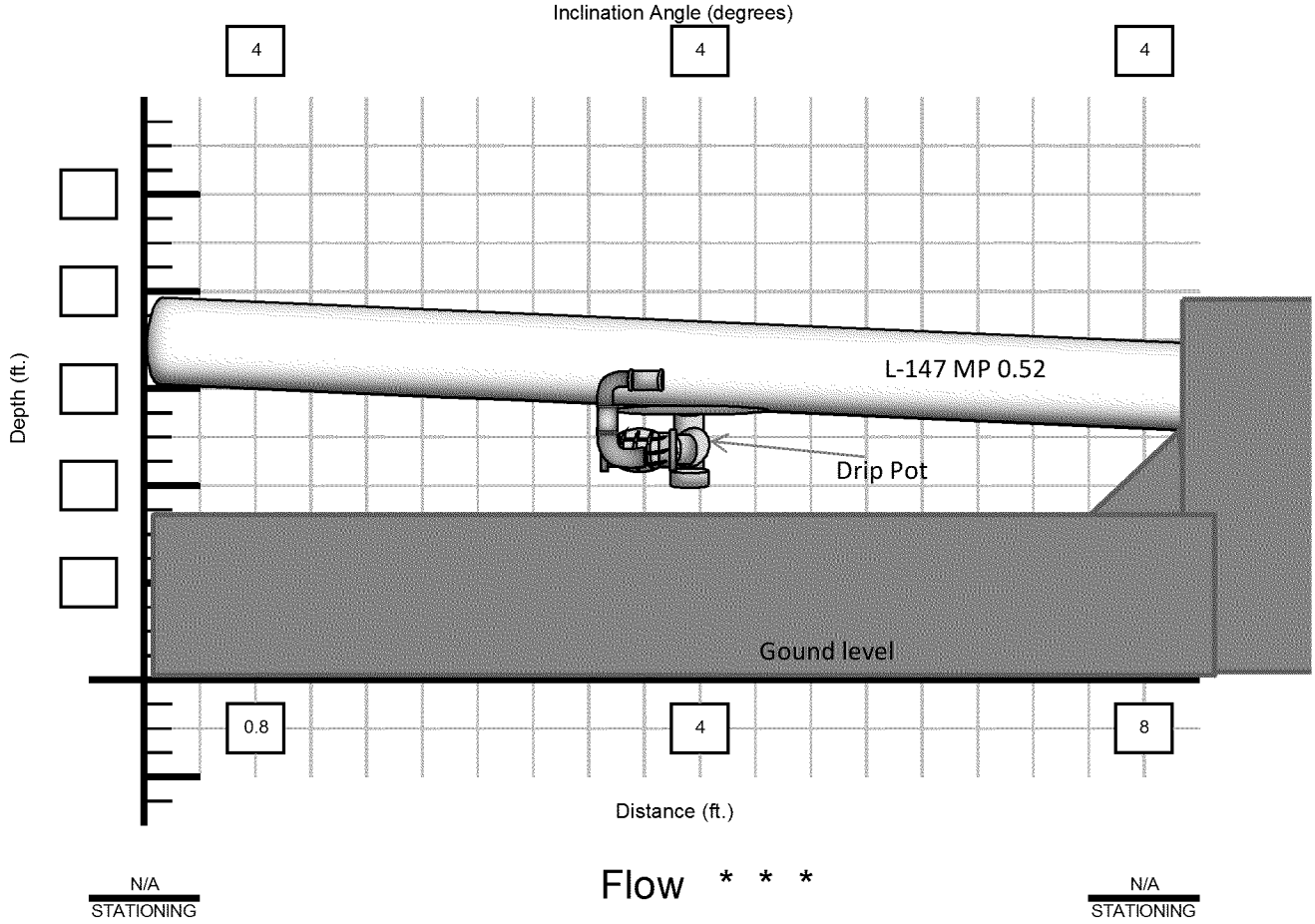
Drip Pot
EC-3-2 is the entire circumfrence of the 6'' Dia Drip Pot

Form H: Direct Examination Data Sheet - Page 3 of 10

DA/ILI		DA		ILI	
Route Number:	L-147	N-Segment:	L-147	ILI Log Distance:	N/A
Examination Date:	10/15/2013	IMA Number:	N/A	RMP-11 Ref. Section:	N/A
Mile Point:	0.52		N/A	Reference Girth Weld:	N/A
Examination Performed By:	Redacted	Region Number:		Distance From Girth Weld:	N/A
PG&E Project Manager:		Subregion # (ICDA):			
Approved By:		Stationing:	N/A		
Order Number:	4151987				

Excavation Drawing:

At minimum draw pipe elevation profile and indicate stationing of 1) low point and 2) critical inclination angle.
Place an arrow on the drawing indicating direction of gas flow in the region(s). Other labels may also be added (e.g. "to Station").



NOTES: (Record stationing and names of nearby landmarks such as creeks and roads. Provide any additional information that may help in spatially positioning pipe):

This site was located in a forrest region of S Redacted

EXTERNAL PIT DEPTH MEASUREMENT GRID SHEETS

DA/ILI

Route Number: L-147
Examination Date: 10/15/2013
Mile Point: 0.52
Examination Performed By: Redacted
PG&E Project Manager:
Approved By:
Order Number: 4151987

DA

N-Segment: L-147
IMA Number: N/A
N/A
Region Number:
Subregion# (ICDA):
Stationing: N/A

ILI

ILI Log Distance: N/A
RMP-11 Ref. Section: N/A
Reference Girth Weld: N/A
Distance From Girth Weld: N/A

Grid Size = 1 Inch x 1 Inch (specify grid size)
Clock Position (specify below)

N/A Readings are readings that were unattainable due to Welds

Anomaly #: EC-1, EC-2, EC-3-1 Grid #:

EC-1

	1	2	3
A	0.081	0.057	0.005
B	0.075	0.058	0.013
C	0.049	0.043	0.016
D	0.025	0.022	0.009

EC-2

	1	2	3	4
A	0.009	0.000	0.012	0.000
B	0.005	0.020	0.028	0.042
C	0.000	0.024	0.029	0.003

Maximum 24.9% Wall Loss Due to External Corrosion EC-1

EC-3-1

	1	2	3	4	5	6
A	0.000	0.010	0.027	0.030	0.000	N/A
B	0.005	0.012	0.030	0.049	0.033	0.022
C	0.000	0.017	0.039	N/A	0.031	0.020
D	0.000	0.013	0.050	0.023	0.008	0.057
E	0.000	0.005	0.018	0.065	0.058	0.058
F	0.025	0.049	0.058	N/A	L/S	L/S
G	0.024	0.000	0.062	0.012	0.048	0.073
H	0.006	0.008	0.012	N/A	0.053	0.048
I	0.002	0.014	0.023	N/A	0.057	0.030

EC3-1 is on the main line and Tie-in plate of drip line. It interacts with EC 3-2 on the

PIT DEPTH GRID 1 OF 2

EXTERNAL PIT DEPTH MEASUREMENT GRID SHEETS

DA/ILI

Route Number: L-147
Examination Date: 10/15/2013
Mile Point: 0.52
Examination Performed By: Redacted
PG&E Project Manager:
Approved By:
Order Number: 4151987

DA

N-Segment: L-147
IMA Number: N/A
N/A
Region Number:
Subregion# (ICDA):
Stationing: N/A

ILI

ILI Log Distance: N/A
RMP-11 Ref. Section: N/A
Reference Girth Weld: N/A
Distance From Girth Weld: N/A

Grid Size = _____ Inch x _____ Inch (specify grid size)
Clock Position (specify below)

Anomaly #: EC-3-2 Grid #: _____

EC-3-2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
A	0.005	0.000	0.009	0.005	0.002	0.000	0.000	0.010	0.008	0.009	0.012	0.021	0.018	0.007	0.015	0.015	0.008	0.014	0.019	0.010	0.005
B	0.004	0.003	0.003	0.003	0.002	0.016	0.004	0.006	0.014	0.021	0.020	0.019	0.007	0.018	0.019	0.015	0.004	0.030	0.006	0.007	0.035
C	0.001	0.003	0.008	0.000	0.000	0.000	0.000	0.003	0.014	0.005	0.007	0.000	0.000	0.026	0.028	0.005	0.006	0.012	0.010	0.036	0.045
D	0.000	0.000	0.000	0.013	0.016	0.007	0.009	0.018	0.022	0.015	0.000	0.005	0.004	0.011	0.016	0.019	0.039	0.045	0.000	0.000	0.000
E	0.000	0.000	0.000	0.000	0.027	0.008	0.015	0.010	0.034	0.014	0.005	0.000	0.000	0.010	0.010	0.042	0.058	0.039	0.000	0.000	0.000
F	0.000	0.000	0.000	0.006	0.015	0.014	0.002	0.011	0.000	0.015	0.000	0.006	0.035	0.051	0.033	0.046	0.053	0.042	0.000	0.000	0.000
G	0.000	0.000	0.000	0.000	0.005	0.013	0.004	0.005	0.005	0.003	0.000	0.004	0.033	0.034	0.025	0.031	0.026	0.021	0.000	0.000	0.000
H	0.000	0.000	0.000	0.003	0.006	0.007	0.010	0.010	0.006	0.003	0.004	0.028	0.034	0.033	0.032	0.037	0.017	0.022	0.000	0.000	0.000
I	0.042	0.018	0.020	0.009	0.009	0.022	0.005	0.000	0.016	0.031	0.034	0.016	0.042	0.032	0.026	0.035	0.026	0.033	0.062	0.033	0.028
J																					
K																					
L																					
M																					
N																					
O																					
P																					
Q																					
R																					
S																					
T																					
U																					
V																					
W																					
X																					

Maximum 22.1 % Wall Loss Due to External Corrosion EC-3-2

EC 3-2 on the drip line, covers the full circumference, and interacts with EC 3-1

PIT DEPTH GRID 2 OF 2

Form H: Direct Examination Data Sheet - Page 6 of 10

INTERNAL CORROSION PIT DEPTH GRID

DA/ILI

Route Number: L-147
Examination Date: 10/15/2013
Mile Point: 0.52
Examination Performed By: Redacted
PG&E Project Manager:
Approved By:
Order Number: 4151987

DA

N-Segment: L-147
IMA Number: N/A
N/A
Region Number:
Subregion# (ICDA):
Stationing: N/A

ILI

ILI Log Distance: N/A
RMP-11 Ref. Section: N/A
Reference Girth Weld: N/A
Distance From Girth Weld: N/A

Grid Size = 1 Inch x 1 Inch
Clock Position (specify below)

2' from U/S Edge

UT Data in Inches

	1	2	3	4	5	6	7	8	9	10	11	12
A	0.334	0.335	0.333	0.337	0.337	0.337	0.332	0.333	0.332	0.331	0.330	0.331
B	0.331	0.334	0.333	0.334	0.335	0.335	0.335	0.333	0.333	0.332	0.332	0.331
C	0.334	0.334	0.337	0.336	0.334	0.336	0.337	0.333	0.335	0.335	0.333	0.336
D	0.333	0.334	0.334	0.333	0.333	0.334	0.333	0.334	0.334	0.333	0.334	0.332
E	0.333	0.332	0.333	0.333	0.332	0.333	0.334	0.334	0.333	0.334	0.333	0.332
F	0.333	0.333	0.333	0.332	0.335	0.337	0.334	0.333	0.332	0.333	0.333	0.331
G	0.337	0.335	0.334	0.333	0.335	0.331	0.330	0.329	0.331	0.331	0.333	0.329
H	0.333	0.332	0.333	0.331	0.332	0.336	0.332	0.332	0.332	0.333	0.332	0.330
I	0.331	0.330	0.331	0.334	0.331	0.331	0.332	0.332	0.332	0.331	0.331	0.330
J	0.331	0.329	0.330	0.330	0.331	0.331	0.330	0.331	0.330	0.329	0.329	0.330
K	0.329	0.327	0.333	0.335	0.335	0.333	0.333	0.333	0.333	0.332	0.331	0.329
L	0.332	0.331	0.330	0.334	0.330	0.330	0.332	0.331	0.330	0.331	0.332	0.330

6:00

→

INTERNAL CORROSION GRID
1 of 1

Form H: Direct Examination Data Sheet - Page 7 of 10

COATING DAMAGE

DA/ILI		DA		ILI	
Route Number:	L-147	N-Segment:	L-147	ILI Log Distance:	N/A
Examination Date:	10/15/2013	IMA Number:	N/A	RMP-11 Ref. Section:	N/A
Mile Point:	0.52		N/A	Reference Girth Weld:	N/A
Examination Performed By:	Redacted	Region Number:		Distance From Girth Weld:	N/A
PG&E Project Manager:		Subregion# (ICDA):			
Approved By:		Stationing:	N/A		
Order Number:	4151987				

Coating Not Inspected

NO.	FEET FROM REFERENCE	O'CLOCK	MAX LENGTH (IN.)	MAX CIRC EXTENT (IN.)

CORROSION LOG

DA/ILI

Route Number: L-147
Examination Date: 10/15/2013
Mile Point: 0.52
Examination Performed By: Redacted
PG&E Project Manager:
Approved By:
Order Number: 4151987

DA

N-Segment: L-147
IMA Number: N/A
N/A
Region Number:
Subregion# (ICDA):
Stationing: N/A

ILI

ILI Log Distance: N/A
RMP-11 Ref. Section: N/A
Reference Girth Weld: N/A
Distance From Girth Weld: N/A

IC or EC	FEET FROM REFERENCE	O'CLOCK	MAX PIT DEPTH (MILS)	MAX LENGTH (IN.)	MAX CIRC EXTENT (IN.)
EC-1	2'9"	7:00	81	4	3
EC-2	3'5.5"	7:30	42	4	3
EC-3-1	48"	6:30	73	9	6
EC-3-2	1" From start of Drip	entire circ	62	21	9

Maximum 24.9% Wall Loss Due to External Corrosion EC 1

PHOTO LOG

DA/ILI

Route Number: L-147
Examination Date: 10/15/2013
Mile Point: 0.52
Examination Performed By: Redacted
PG&E Project Manager:
Approved By:
Order Number: 4151987

DA

N-Segment: L-147
IMA Number: N/A
N/A
Region Number:
Subregion# (ICDA):
Stationing: N/A

ILI

ILI Log Distance: N/A
RMP-11 Ref. Section: N/A
Reference Girth Weld: N/A
Distance From Girth Weld: N/A

PHOTO NO.	LOCATION	DESCRIPTION	COMMENTS
1			
2			
3			
4			
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38			
39			
40			

DA/ILI		DA		ILI	
Route Number:	L-147	**N-Segment:**	L-147	**ILI Log Distance:**	N/A
Examination Date:	10/15/2013	**IMA Number:**	N/A	**RMP-11 Ref. Section:**	N/A
Mile Point:	0.52		N/A	**Reference Girth Weld:**	N/A
Examination Performed By:	Redacted	**Region Number:**		**Distance From Girth Weld:**	N/A
PG&E Project Manager:		**Subregion # (ICDA):**			
Approved By:		**Stationing:**	N/A		
Order Number:	4151987				

3.0 Recoat Data

3.1 Sandblast Media: _____ **Anchor Profile Measurement:** mils

3.2 Pipe Recoated With:

☐ Powercrete J ☐ Wax Tape ☐ Bar-Rust 235 ☐ Dev Grip 238 ☐ Dev Tar 247 ☐ Protal 7200 ☐ PE Tape

3.3 For Epoxy Coating Systems, Record Environmental Condition:

Air Temperature: °F Dew Point: °F

Pipe Temperature: °F Relative Humidity: %

Time of Day:

3.4 Repair Coating Hardness (If ARC Coating:) _____

3.5 Measured Coating Thickness: 3:00 - 0 - 0 mils 6:00 - _____ 9:00 - _____ 12:00 - _____

Holiday Tested?: ☐ Yes ☐ No

Device Used: ☐ Coil ☐ Wet Sponge Voltage Used: _____ Repair All Holidays.

3.6 Coupon Test Station Installed?: ☐ Yes ☐ No **ETS Installed?:** ☐ Yes ☐ No

If Yes, Date Installed: _____

Surface Configuration:: ☐ Fink ☐ G-5 Box ☐ Carsonite ☐ Other: _____

3.7 Backfill Material: ☐ Native ☐ Imported Sand ☐ Other: _____

Coating Protections?: ☐ Yes ☐ No

If Yes, Check One: ☐ Rockguard ☐ Tuff-N-Nuff ☐ PipeSaver ☐ Other: _____

3.8 Pipe-to-Soil Readings Over Bell Hole After Backfill: _____

*If specified, a CIS should be done for approximately 100' on either side of the bell hole. Attach data.

Comments: The Pipe-to-Soil was taken with a CSE.

3.9 Attach site sketch of excavation site.

4.0 Repair Data

4.1 Repair Made: ☐ Yes ☐ No **4.1 Number of Repairs Made:** _____

4.3 Repair Type: ☐ Metallic Sleeve ☐ Non Metallic Sleeve ☐ Replace ☐ Can ☐ Filler Metal ☐ Other

4.4 Damage Repaired: ☐ Corrosion ☐ Mechanical ☐ Other

Misc. Comments/Information: This site is located in San Carlos, California. This is a soil excavation the pipe is spanning a creek. This pipe is a 24" diameter This pipe has a SSAW LSW verified by PG&E ATS RT crew. This is a limited Form-H because the coating was removed prior to the arrival Mears Tech and the main focus is the corrosion measurement. This PG&E project is an ICDA, PG&E was looking for Internal corrosion in the bottom of the Carrier pipe. There was none found. This pipe was not Media Blasted. There was some external corrosion that was found on the Bottom of the pipe at the 6:00 where there was a drip pot coming off the bottom of the line at 35" from the U/S Edge of coating removal. The drip pot is 13" long and has a 3" cap at the end of that. 5" down from the weld of the Drip pot and the carrier pipe there is a 2" pipe coming out of the drip pot, this pipe goes into a valve and then a 90 degree elbow up to a straight pipe then a 90 degree elbow that goes North into a Vaccing fitting. There were 4 Corrosion cells that were manually gridded. The most severe of these corrosion cells was EC-1 with a depth of 081" or 24.9% wall loss. EC-3 was split into two corrosion cells (EC 3-1 and EC 3-2) for grid measurement purposes. EC-3 interacts with the main line, tie-in plate, and the full circumference of the drip line.

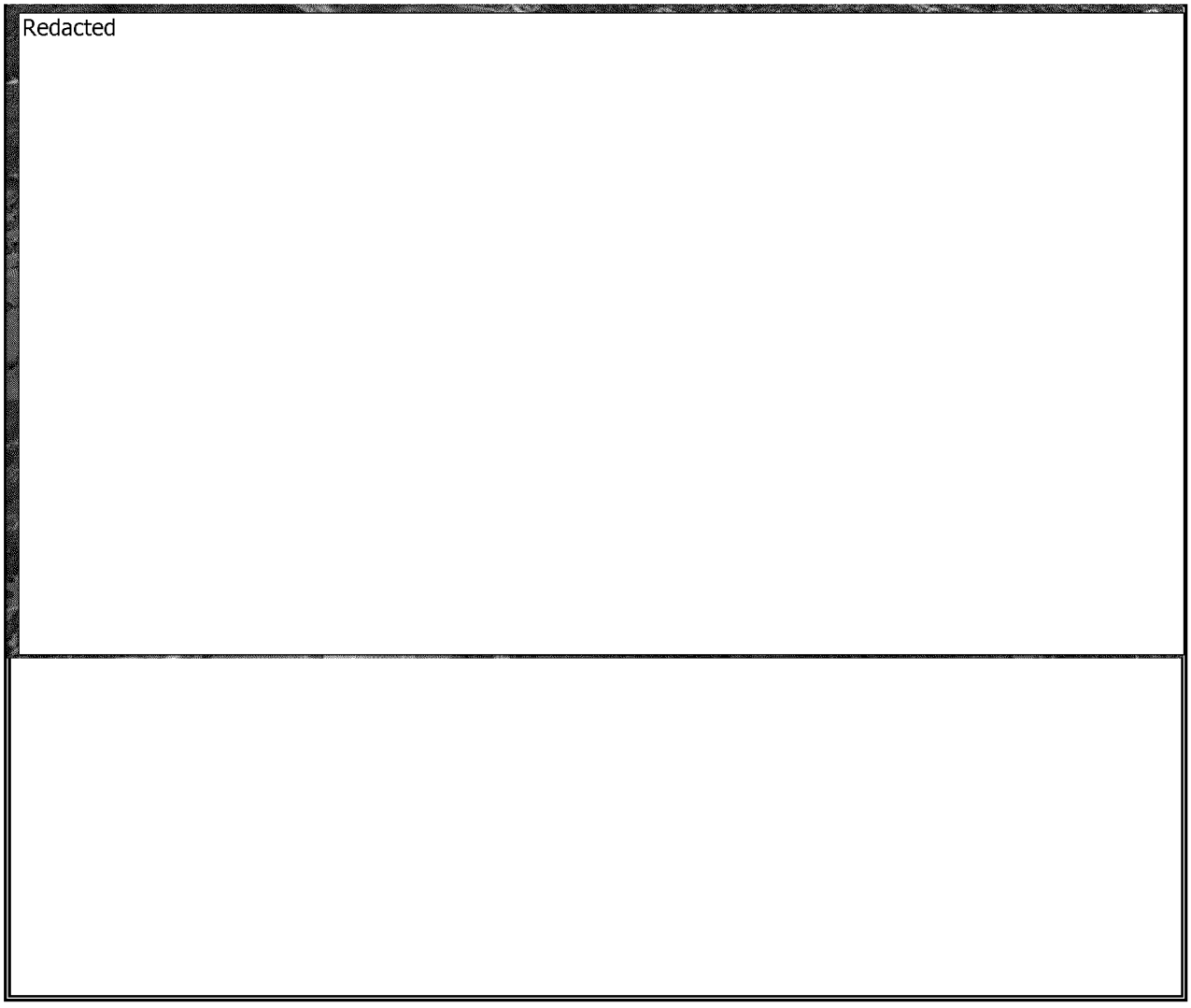
Excavation size: N/A

Mears Job Number: N/A

Form H: Site Map

DA/ILI		DA		ILI	
Route Number:	L-147	N-Segment:	L-147	ILI Log Distance:	N/A
Examination Date:	10/15/2013	IMA Number:	N/A	RMP-11 Ref. Section:	N/A
Mile Point:	0.52		N/A	Reference Girth Weld:	N/A
Examination Performed By:	Redacted	Region Number:		Distance From Girth Weld:	N/A
PG&E Project Manager:		Subregion # (ICDA):			
Approved By:		Stationing:	N/A		
Order Number:	4151987				

*Sketch Not Drawn to Scale



Misc. Comments/Information About Area Surrounding Ditch: This site is located in the City of San Carlos in California, The closest intersection to this sit Redacted