



B R O W N S V I L L E
PUBLIC UTILITIES BOARD

Date: November 17, 2023
To: All Vendors
Subject: Addendum #1

REFERENCE: P015-24 Substation Power Transformer & LTC Field Service to Remove, Dispose, & Retro-fill Corrosive Oil

This Addendum forms part of the contract and clarifies, corrects or modifies original proposal document.

Question 1: Do you need pre-testing to check the conditions of the insulation and post-testing to ensure the job was completed correctly from these transformers?

Answer 1: No, this will be done in-house.

Question 2: Please provide a copy of the DGA data, so that we can see baseline oil conditions for each transformer before removing oil.

Answer 8: The latest oil analysis was done in June 2023. See attachments.

The signature of the company agent, for the acknowledgement of this addendum, shall be required. **Complete information below and return via e-mail to: hlopez@brownsville-pub.com and to dsolitaire@brownsville-pub.com.**

I hereby acknowledge receipt of this addendum.

Company: _____

Agent Name: _____

Agent Signature: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone Number: _____ E-mail address: _____

If you have any further questions about the Proposal, call 956-983-6375.

Hugo E. Lopez

BY: Hugo E. Lopez
Purchasing

Customer 9554000 Brownsville Public Utilities
Sub-Name MIDTOWN

City Brownsville, TX
Unit No. T2

Location OUTDOOR/GROUND
Other

NAMEPLATE DATA

Manufacturer	GE PROLEC	Equipment Type	TRANSFORMER
Manufacture Date	10/1/2004	Transformer Class	ONAN/ONAF
Serial No.	G1406-01	Impedance %	9.74
KVA Rating	15,000	Phase/Cycle	3/60
High Voltage	138,000	Liquid Type	OIL
Low Voltage	12,470	Gallons	5,684
Weight	55,010	Other Access	TOP INSPECTION PLATE

ADDITIONAL EQUIPMENT

Radiators	Yes	Conservator Tank	No
Fans	Yes	LTC Compartment	Yes
Water Cooled	No	Bushing Location	TOP
Oil Pumps	No	Breather	N2 SYSTEM
Top FPV (inch)	1.00 Valve	Hose Length (feet)	50
Bottom FPV (inch)	2.00 Valve	Service Online	Yes
InsulationType	55/65C	Power Available	Yes

VISUAL INSPECTION

DATE	LEVEL	SAMPLE TEMP	TOP TEMP	P/V	PAINT	LEAKS
06/22/20	NORMAL	33	55	3.75	GOOD	NONE
06/09/21	NORMAL		45	3.00	FAIR	NONE
06/06/22	NORMAL	29	41	2.50	FAIR	NONE
06/09/23	NORMAL	36	40			NONE

FIELD SERVICE

DATE	SERVICE
05/16/23	RETROFILL

Additional Information 6/9/2023 1:58:00 PM CORROSIVE SULFUR TEST (48 HRS. @ 150 C): CORROSIVE 4a

Reason Not Tested

LIQUID SCREEN TEST DATA

DATE	SERVICE	ACID	IFT	DIEL 877	DIEL 1816	GAP	COLOR	SP. GRAV.	VISUAL	SEDIMENT
05/24/12		0.020 AC	40.9 AC	42 AC			0.50 AC	0.890 AC	CLEAR AC	NONE AC
05/01/13		0.010 AC	40.5 AC	44 AC			0.50 AC	0.880 AC	CLEAR AC	NONE AC
06/27/18		0.010 AC	39.0 AC	46 AC			0.50 AC	0.890 AC	CLEAR AC	NONE AC
06/27/19		0.010 AC	40.0 AC	35 AC			0.50 AC	0.880 AC	CLEAR AC	NONE AC
06/22/20		0.020 AC	40.5 AC	49 AC			0.50 AC	0.875 AC	CLEAR AC	NONE AC
06/09/21		0.010 AC	39.0 AC	37 AC			0.50 AC	0.880 AC	CLEAR AC	NONE AC
06/06/22		0.010 AC	38.4 AC	59 AC			0.50 AC	0.886 AC	CLEAR AC	NONE AC
06/09/23		0.020 AC	36.8 AC	48 AC			0.50 AC	0.882 AC	CLEAR AC	NONE AC

INHIBITOR CONTENT

DATE	PCT. BY WEIGHT
10/25/06	<0.02% UN

NOTE - THIS UNIT HAS A BLADDER OR CONTINUOUS N2 SYSTEM. THEREFORE, THE UNIT DOES NOT REQUIRE INHIBITED OIL. HOWEVER, HAVING INHIBITED OIL WILL PROVIDE ADDITIONAL PROTECTION AGAINST OIL OXIDATION IF THE CURRENT OIL PRESERVATION SYSTEM WERE TO EVER FAIL.

LIQUID POWER FACTOR

DATE	25 C	100 C
06/27/18	0.008 AC	0.161 AC
06/27/19	0.010 AC	0.277 AC
06/09/21	0.001 AC	0.088 AC
06/06/22	0.009 AC	0.322 AC
06/09/23	0.014 AC	0.211 AC

KEY TO ABBREVIATIONS: AC - ACCEPTABLE QU - QUESTIONABLE UN - UNACCEPTABLE RS - RESAMPLE

NOTE: * After a result indicates that the test or service was performed by an outside source.

Customer 9554000 Brownsville Public Utilities
Sub-Name MIDTOWN
Location OUTDOOR/GROUND

S/N G1406-01
Mfg. GE PROLEC
Unit No. T2

Gallons 5,684
KVA 15,000

High Volt. 138,000
Low Volt. 12,470

KARL FISCHER TESTING MOISTURE CONTENT EXPRESSED IN PPM

DATE	AVG.		PCT.		MOISTURE BY DRY	
	TEMP	PPM	SATURATION	AC	WEIGHT PCT.	
06/27/19	35	6	6.0	AC	0.60	
06/22/20	38	8	7.1	AC	0.66	
06/09/21	35	5	5.0	AC	0.50	
06/06/22	34	4	4.1	AC	0.43	
06/09/23	41	9	6.8	AC	0.58	

RECOMMENDATION RETEST 1 YEAR

The moisture content continues to be acceptable based on the equipment and liquid type. Continued normal monitoring is indicated.

FURAN ANALYSIS EXPRESSED IN PPB

DATE	5H2F	2FOL	2FAL	2ACF	5M2F	TOTAL
06/27/18	ND	ND	1	ND	ND	1
06/27/19	ND	ND	1	ND	ND	1
06/22/20	ND	ND	13	ND	ND	13
06/09/21	ND	ND	4	ND	ND	4
06/06/22	ND	ND	4	ND	ND	4
06/09/23	ND	ND	3	ND	ND	3

RECOMMENDATION RETEST 1 YEAR

NO DIAGNOSTIC CHANGES ARE NOTED IN FURAN LEVELS SINCE THE PREVIOUS ANALYSIS. THE CELLULOSIC INSULATION APPEARS TO BE IN GOOD CONDITION.

CALCULATED DP <800 **EST. LIFE REMAINING** <100%

GAS-IN-OIL ANALYSIS GAS CHROMATOGRAPHY EXPRESSED IN PPM

DATE	HYDROGEN	OXYGEN	NITROGEN	METHANE	CARBON		ETHANE	ETHYLENE	ACETYLENE	TOTAL COMBUST.	TOTAL GAS
					MONOXIDE	DIOXIDE					
05/24/12	19	8,173	74,344	25	130	1,482	53	6	ND	233	84,232
05/01/13	19	10,515	80,795	28	137	1,650	64	12	ND	260	93,220
06/27/18	12	260	96,425	23	93	1,507	41	5	ND	174	98,366
06/27/19	ND	158	93,084	26	115	2,190	64	4	ND	209	95,641
06/22/20	12	318	86,122	22	103	2,001	54	6	ND	197	88,638
06/09/21	12	141	82,262	22	81	1,663	47	5	ND	167	84,233
06/06/22	7	137	74,325	21	75	1,898	48	6	ND	157	76,517
06/09/23	9	90	57,538	12	41	945	31	4	ND	97	58,670

RECOMMENDATION IMMED. RETEST (DUE TO PRCL CNT)

B-THE ANALYSIS OF THIS SAMPLE SHOWS NO SIGNIFICANT INCREASE IN THE COMBUSTIBLE GAS VOLUME. THIS INDICATES NORMAL OPERATION.

ICP METALS-IN-OIL EXPRESSED IN PPM

DATE	ALUMINUM	IRON	COPPER
06/02/05	<0.1	<0.03	<0.01
10/25/06	<0.1	<0.03	<0.01
05/20/11	<0.1	<0.03	<0.01
05/24/12	<0.1	<0.03	<0.01
05/01/13	<0.1	<0.03	0.04

RECOMMENDATION RETEST 1 YEAR

THERE HAS BEEN NO DIAGNOSTIC CHANGE SINCE THE PREVIOUS ANALYSIS. THESE DATA INDICATE NORMAL OPERATION.

PCB CONTENT EXPRESSED IN PPM

DATE	1242	1254	1260	OTHER	TOTAL
05/24/12	ND	ND	ND	ND	ND
05/01/13	ND	ND	ND	ND	ND
06/22/20	ND	ND	ND	ND	ND
06/09/21	ND	ND	ND	ND	ND
06/06/22	2	ND	ND	ND	2
06/09/23	ND	ND	ND	ND	ND

COLOR LABEL: Green **CLASS:** NON-PCB

Results in mg/kg
ND means None Detected
 (<2 mg/kg per ASTM D4059)

Customer 9554000 Brownsville Public Utilities
Sub-Name MIDTOWN

City Brownsville, TX
Unit No. T2

Location OUTDOOR/GROUND
Other EQUIP: MOTC 10 ft

NAMEPLATE DATA

Equipment Type LOAD TAP CHANGER
Manufacturer GE PROLEC
Serial No. G1406-01
LTC Model No.
LTC for TC No. 312

Liquid Type OIL
LTC Gallons
Selector Gallons 279.00
Transfer/Diverter Gallons

ADDITIONAL EQUIPMENT

Conservator Tank No
Silica Gel Yes
Breather FREE
Top FPV (inch) 0.50 Plug
Bottom FPV (inch) 1.00 Valve

VISUAL INSPECTION

DATE	LEVEL	SAMPLE TEMP	TOP TEMP	P/V	PAINT	Tap Counter Reading	LEAKS
06/22/20	NORMAL	32			FAIR	52824	NONE
06/09/21	NORMAL		51		FAIR	58278	NONE
06/06/22	NORMAL	33	41		FAIR	78240	NONE
06/09/23	NORMAL	44	45			95661	NONE

FIELD SERVICE

DATE 05/16/23
SERVICE RETROFILL

Additional Information 6/9/2023 1:56:00 PM CORROSIVE SULFUR TEST (48 HRS. @ 150 C): CORROSIVE 4a

Reason Not Tested

LIQUID SCREEN TEST DATA

DATE	SERVICE	ACID	IFT	DIEL 877	DIEL 1816	GAP	COLOR	SP. GRAV.	VISUAL	SEDIMENT
05/24/12		0.020 AC	40.0 AC	35 AC			0.50 AC	0.890 AC	CLEAR AC	NONE AC
05/01/13		0.020 AC	40.1 AC	44 AC			0.50 AC	0.885 AC	CLEAR AC	NONE AC
06/27/18		0.030 AC	37.1 AC	50 AC			0.75 AC	0.880 AC	CLEAR AC	NONE AC
06/27/19		0.020 AC	37.4 AC	43 AC			0.50 AC	0.880 AC	CLEAR AC	NONE AC
06/22/20		0.020 AC	36.4 AC	44 AC			1.00 AC	0.880 AC	CLEAR AC	NONE AC
06/09/21		0.010 AC	37.3 AC	51 AC			0.50 AC	0.880 AC	CLEAR AC	NONE AC
06/06/22		0.030 AC	37.0 AC	37 AC			1.00 AC	0.884 AC	CLEAR AC	NONE AC
06/09/23		0.020 AC	39.5 AC	46 AC			0.50 AC	0.882 AC	CLEAR AC	NONE AC

INHIBITOR CONTENT

DATE	PCT. BY WEIGHT
10/25/06	<0.02% UN

NOTE - STUDIES SHOW THAT A LEVEL OF 0.3% INHIBITOR IS OPTIMUM FOR PRESERVATION OF IN-SERVICE TRANSFORMER OILS. OILS WITH A LEVEL BELOW 0.08% ARE CONSIDERED TO BE UNINHIBITED.

LIQUID POWER FACTOR

DATE	25 C	100 C
05/24/12	0.017	0.194
05/01/13	0.020	0.396
06/27/18	0.005	0.330
06/27/19	0.081	1.460
06/09/21	0.001	0.206

KEY TO ABBREVIATIONS: AC - ACCEPTABLE QU - QUESTIONABLE UN - UNACCEPTABLE RS - RESAMPLE

NOTE: * After a result indicates that the test or service was performed by an outside source.

Customer 9554000 Brownsville Public Utilities
Sub-Name MIDTOWN
Location OUTDOOR/GROUND

S/N G1406-01
Mfg. GE PROLEC
Unit No. T2

Gallons
KVA

High Volt.
Low Volt.

KARL FISCHER TESTING MOISTURE CONTENT EXPRESSED IN PPM

DATE	AVG. TEMP	PPM	PCT.		MOISTURE BY DRY
			SATURATION	AC	WEIGHT PCT.
06/27/18	38	27	N/A	AC	N/A
06/27/19	45	24	N/A	AC	N/A
06/22/20	37	26	N/A	AC	N/A
06/09/21	41	22	N/A	AC	N/A
06/06/22	38	24	N/A	AC	N/A
06/09/23	49	20	N/A	AC	N/A

RECOMMENDATION RETEST 1 YEAR

The moisture content continues to be acceptable based on the equipment and liquid type. Continued normal monitoring is indicated.

FURAN ANALYSIS EXPRESSED IN PPB

DATE	5H2F	2FOL	2FAL	2ACF	5M2F	TOTAL
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GAS-IN-OIL ANALYSIS GAS CHROMATOGRAPHY EXPRESSED IN PPM

DATE	HYDROGEN	OXYGEN	NITROGEN	METHANE	CARBON		ETHANE	ETHYLENE	ACETYLENE	TOTAL COMBUST.	TOTAL GAS
					MONOXIDE	DIOXIDE					
06/02/05	8	30,015	62,958	3	9	502	ND	4	ND	24	93,499
06/27/18	36	16,969	58,558	17	115	1,729	1	9	ND	178	77,434
06/27/19	ND	29,043	82,574	31	264	3,729	3	11	ND	309	115,655
06/22/20	50	21,763	71,583	30	289	3,536	3	14	ND	386	97,268
06/09/21	59	19,050	70,368	37	293	3,682	3	14	ND	406	93,506
06/06/22	66	17,758	64,914	42	314	4,464	4	16	ND	442	87,578
06/09/23	56	11,143	52,061	25	194	2,449	3	10	ND	288	65,941

RECOMMENDATION RETEST 1 YEAR

B-THE ANALYSIS OF THIS SAMPLE SHOWS NO SIGNIFICANT INCREASE IN THE COMBUSTIBLE GAS VOLUME. THIS INDICATES NORMAL OPERATION.

ICP METALS-IN-OIL EXPRESSED IN PPM

DATE	ALUMINUM	IRON	COPPER
06/02/05	<0.1	<0.03	0.04
10/25/06	<0.1	<0.03	0.06
06/27/18	<0.1	<0.03	<0.01
06/27/19	<0.1	<0.03	0.02
06/22/20	<0.1	<0.03	<0.01
06/09/21	<0.1	<0.03	<0.01

RECOMMENDATION

NO RECOMMENDATION IS POSSIBLE FOR THIS SAMPLE. WE ARE UNAWARE OF ANY PARAMETERS OR GUIDANCE THAT WOULD ENABLE US TO INTERPRET THESE RESULTS OR DETERMINE AN APPROPRIATE MONITORING SCHEDULE.

PCB CONTENT EXPRESSED IN PPM

DATE	1242	1254	1260	OTHER	TOTAL
06/22/20	ND	ND	ND	ND	ND
06/09/21	ND	ND	ND	ND	ND

COLOR LABEL: Green **CLASS:** NON-PCB

Results in mg/kg
 ND means None Detected
 (<2 mg/kg per ASTM D4059)

Customer 9554000 Brownsville Public Utilities
Sub-Name POWER PLANT

City Brownsville, TX
Unit No. 10

Location OUTDOOR/GROUND
Other

NAMEPLATE DATA

Manufacturer	GE PROEC	Equipment Type	TRANSFORMER
Manufacture Date	11/1/2003	Transformer Class	ONAN/ONAF
Serial No.	G1230-01	Impedance %	9.48
KVA Rating	36,000	Phase/Cycle	3/60
High Voltage	138,000 Y	Liquid Type	OIL
Low Voltage	69,000 D	Gallons	6,850
Weight	77,920	Other Access	TOP INSPECTION PLATE

ADDITIONAL EQUIPMENT

Radiators	Yes	Conservator Tank	No
Fans	Yes	LTC Compartment	No
Water Cooled	No	Bushing Location	TOP
Oil Pumps	No	Breather	N2 SYSTEM
Top FPV (inch)	1.00 Valve	Hose Length (feet)	200
Bottom FPV (inch)	2.00 Valve	Service Online	Yes
InsulationType	55/65C	Power Available	Yes

VISUAL INSPECTION

DATE	LEVEL	SAMPLE TEMP	TOP TEMP	P/V	PAINT	LEAKS
06/25/20	NORMAL	33	40	2.00	GOOD	NONE
06/11/21	NORMAL	33	48	3.50	FAIR	NONE
06/08/22	NORMAL	34	52	3.00	GOOD	NONE
06/08/23	NORMAL	36	50	3.00		NONE

FIELD SERVICE

DATE	SERVICE
05/16/23	RETROFILL

Additional Information 6/8/2023 2:44:00 PM CORROSIVE SULFUR TEST (48 HRS. @ 150 C): CORROSIVE 4a

Reason Not Tested

LIQUID SCREEN TEST DATA

DATE	SERVICE	ACID	IFT	DIEL 877	DIEL 1816	GAP	COLOR	SP. GRAV.	VISUAL	SEDIMENT
05/24/12		0.020 AC	41.0 AC	36 AC			0.50 AC	0.890 AC	CLEAR AC	NONE AC
05/01/13		0.010 AC	40.3 AC	44 AC			0.50 AC	0.880 AC	CLEAR AC	NONE AC
06/29/18		0.010 AC	41.6 AC	36 AC			0.50 AC	0.890 AC	CLEAR AC	NONE AC
06/25/19		0.020 AC	40.9 AC	30 AC			0.50 AC	0.880 AC	CLEAR AC	NONE AC
06/25/20		0.020 AC	39.8 AC	38 AC			0.50 AC	0.890 AC	CLEAR AC	NONE AC
06/11/21		0.010 AC	39.0 AC	42 AC			0.50 AC	0.880 AC	CLEAR AC	NONE AC
06/08/22		0.020 AC	37.4 AC	47 AC			1.00 AC	0.884 AC	CLEAR AC	NONE AC
06/08/23		0.020 AC	36.0 AC	46 AC			0.50 AC	0.880 AC	CLEAR AC	NONE AC

INHIBITOR CONTENT

DATE	PCT. BY WEIGHT
10/25/06	<0.02% UN

NOTE - THIS UNIT HAS A BLADDER OR CONTINUOUS N2 SYSTEM. THEREFORE, THE UNIT DOES NOT REQUIRE INHIBITED OIL. HOWEVER, HAVING INHIBITED OIL WILL PROVIDE ADDITIONAL PROTECTION AGAINST OIL OXIDATION IF THE CURRENT OIL PRESERVATION SYSTEM WERE TO EVER FAIL.

LIQUID POWER FACTOR

DATE	25 C	100 C
06/29/18	0.016 AC	0.273 AC
06/25/19	0.016 AC	0.360 AC
06/11/21	0.001 AC	0.117 AC
06/08/22	0.007 AC	0.498 AC
06/08/23	0.007 AC	0.180 AC

KEY TO ABBREVIATIONS: AC - ACCEPTABLE QU - QUESTIONABLE UN - UNACCEPTABLE RS - RESAMPLE

NOTE: * After a result indicates that the test or service was performed by an outside source.

Customer 9554000 Brownsville Public Utilities
Sub-Name POWER PLANT
Location OUTDOOR/GROUND

S/N G1230-01
Mfg. GE PROEC
Unit No. 10

Gallons 6,850
KVA 36,000

High Volt. 138,000
Low Volt. 69,000

KARL FISCHER TESTING MOISTURE CONTENT EXPRESSED IN PPM

DATE	AVG. TEMP	PPM	PCT. SATURATION	MOISTURE BY DRY WEIGHT PCT.
06/25/19	31	8	9.3 QU	0.99
06/25/20	38	9	7.6 AC	0.70
06/11/21	38	4	3.1 AC	0.29
06/08/22	39	14	11.7 QU	1.05
06/08/23	41	6	4.4 AC	0.37

RECOMMENDATION RETEST 1 YEAR

The moisture content has decreased since our last analysis. If service has not been performed, this may be due to temperature and/or operational changes. Continued normal monitoring is indicated.

FURAN ANALYSIS EXPRESSED IN PPB

DATE	5H2F	2FOL	2FAL	2ACF	5M2F	TOTAL
06/29/18	ND	ND	1	ND	ND	1
06/25/19	ND	ND	1	ND	ND	1
06/25/20	ND	ND	11	ND	ND	11
06/11/21	ND	ND	5	ND	ND	5
06/08/22	ND	ND	9	ND	ND	9
06/08/23	ND	ND	1	ND	ND	1

RECOMMENDATION RETEST 1 YEAR

NO DIAGNOSTIC CHANGES ARE NOTED IN FURAN LEVELS SINCE THE PREVIOUS ANALYSIS. THE CELLULOSIC INSULATION APPEARS TO BE IN GOOD CONDITION.

CALCULATED DP <800 **EST. LIFE REMAINING** <100%

GAS-IN-OIL ANALYSIS GAS CHROMATOGRAPHY EXPRESSED IN PPM

DATE	HYDROGEN	OXYGEN	NITROGEN	METHANE	CARBON MONOXIDE	CARBON DIOXIDE	ETHANE	ETHYLENE	ACETYLENE	TOTAL COMBUST.	TOTAL GAS
05/01/13	4	9,237	76,997	7	14	1,478	24	1	ND	50	87,762
06/29/18	ND	130	89,814	6	10	1,434	18	2	ND	36	91,414
06/25/19	ND	740	59,146	3	12	1,005	14	ND	ND	29	60,920
06/25/20	ND	417	88,010	6	11	1,668	17	1	ND	35	90,130
06/11/21	5	47	77,783	5	8	1,460	16	1	ND	35	79,325
06/08/22	ND	74	72,759	6	4	565	14	3	ND	27	73,425
06/08/23	1	5	59,112	4	4	507	8	ND	ND	17	59,641

RECOMMENDATION RETEST 1 YEAR

B-THE ANALYSIS OF THIS SAMPLE SHOWS NO SIGNIFICANT INCREASE IN THE COMBUSTIBLE GAS VOLUME. THIS INDICATES NORMAL OPERATION.

ICP METALS-IN-OIL EXPRESSED IN PPM

DATE	ALUMINUM	IRON	COPPER
06/02/05	<0.1	<0.03	<0.01
10/25/06	<0.1	<0.03	0.03
05/20/11	<0.1	<0.03	<0.01
05/24/12	<0.1	<0.03	<0.01
05/01/13	<0.1	<0.03	0.04

RECOMMENDATION RETEST 1 YEAR

THERE HAS BEEN NO DIAGNOSTIC CHANGE SINCE THE PREVIOUS ANALYSIS. THESE DATA INDICATE NORMAL OPERATION.

PCB CONTENT EXPRESSED IN PPM

DATE	1242	1254	1260	OTHER	TOTAL
05/24/12	ND	ND	ND	ND	ND
05/01/13	ND	ND	ND	ND	ND
06/25/20	ND	ND	ND	ND	ND
06/11/21	ND	ND	ND	ND	ND
06/08/22	2	ND	ND	ND	2
06/08/23	ND	ND	ND	ND	ND

COLOR LABEL: Green **CLASS:** NON-PCB

Results in mg/kg
 ND means None Detected
 (<2 mg/kg per ASTM D4059)