WELDING PROCEDURE SPECIFICATION

WPS: 7000-xxxx-HDPE-X2   **REV. NO.:** 0   **DATE:** 3/15/2012   ****APPLICABILITY****

WELDING PROCESS: TF **and** TF   **CODE:** ASME IX   **OTHER:** ANSI B31.3 Ch. VII

SUPPORTING PQR: 7200-HDPE Butt weld

JOINT: This WPS shall be used in conjunction with the General Welding Standards (GWS) and Welding Fabrication Procedure (WFP) sections and criteria for joint details, repairs, NDE, inspection, etc.

Weld Joint Type: Butt   **Class:** N/A

See GWS 1-06 and WFP's for joint details.   **Preparation:** Cut pipe and rough bonding surfaces

Root Opening: N/A   **Backing:** N/A

Backgrind Root: N/A   **Backing Mat.:** N/A

Bkgrd Method: N/A   **GTAW Flux:** N/A   **Backing Retainer:** N/A

FILLER METALS: **Class:** N/A **and** N/A

A No: N/A   **SFA Class:** N/A **and** N/A   **F No:** N/A **and** N/A   **Size:** 0 0 0 0

Insert: N/A   **Insert Type:** N/A   **Weld Metal Thickness Ranges:**

Flux: **Type:** N/A   **Size:** N/A   **AWS Root Pass:** 0 **thru** 0

Filler Material Note: N/A   **AWS Balance:** 0 **thru** 0

     ASME Root Pass: 0 **thru** 0

     ASME Balance: 0 **thru** 0

BASE MATERIAL:

     P No: N/A   **Gr No.:** N/A   **to P No.:** N/A   **Gr No.:** N/A

Spec.: ASTM D3350   **Grade:** N/A   **to Spec.:** ASTM D3350   **Grade:** N/A

Qualified Pipe Dia. Range: >=   **AWS:** 0   **ASME:** 6

Qualified Thickness Range: **AWS:** 0 **thru** 0   **ASME:**

QUALIFIED POSITIONS: **AWS:** N/A   **ASME:** N/A   **Vert. Prog.:** N/A

Preheat Min. Temp.: N/A   **GAS: Shielding:** N/A   **or**   N/A

Interpass Max. Temp.: N/A **°F**   **Gas Composition:** 0 / 0 / 0 **%**   0 / 0 / 0 **%**

Preheat Maintenance: N/A **°F**   **Gas Flow Rate cfh:** 0 **to** 0   0 **to** 0

PWHT: Time @ °F Temp.: 0   **Backing Gas/Comp:** N/A   0 **%**

Temperature Range: N/A **°F to** N/A **°F**   **Backing Gas Flow cfh:** 0 **to** 0

     Trailing Gas/Comp: N/A   0 **%**

WELDING CHARACTERISTICS:

Current: N/A **and** N/A   **Tungsten Type:** N/A   **Transfer Mode:** N/A

Ranges: **Amps:** 0 **to** 0   **Tungsten Dia.:** 0 **to** 0   **Pulsing Cycle:** N/A **to** N/A

     Volts: 0 **to** 0   **Background Current:** N/A

Fuel Gas: N/A   **Flame:** N/A   **Braze Temp °F:** N/A **to** N/A

WELDING TECHNIQUE: For fabrication specific requirements such as fitup, cleaning, grinding, PWHT and inspection criteria, refer to Volume 2, Welding Fabrication Procedures.

Technique: Thermal fusion   **Cleaning Method:** Scrap to remove surface film

Single or Multi Pass: N/A   **Stringer or Weave Bead (S/W):** N/A **or** N/A   **Oscillation:** N/A

GMAW Gun Angle: 0 ° **to** 0 °   **Forehand or Backhand for GMAW:** N/A

No Pass > 1/2": N/A   **GMAW/FCAW Tube to Work Distance (in):** N/A

Maximum K/J Heat Input: N/A **KJ/in**   **Travel Speed:** N/A   **Gas Cup Size:** N/A

PROCEDURE QUALIFIED FOR:

Charpy "V" Notch: N/A   **Nil-Ductile Transition Temperature:** N/A   **Dynamic Tear:** N/A

Comments: This procedure will be used following LANL Large Diameter HDPE Butt Fusion Procedure and piping manufacturer heating and joining equipment or a manufacturer approved equivalent. This procedure may be used only for double wall pipe materials with maximum pipe diameter of 8". Material Handing, storage, heating, pressure, holding, and time @ temperature shall be in accordance with manufacturers and consensus standards, (ANSI/ASME/ASTM, etc.) WPS Data Sheets will be added for each type of plastic pipe, (i.e. PP/PE/PPE/PVDF/HDPE/etc.) that fall within the jurisdiction of ANSI/ASME B31.3 Chap. VII and are performed within the manufacturers instructions/requirements.

Weld Layer	Manual Process	Filler Metals	Size	Amp Range	Volt Range	Travel/ipm	Nozzle Angle	Other
1	TF	N/A	0	0 **to** 0	0 **to** 0	0 **to** 0	0 **to** 0	
2	TF	N/A	0	0 **to** 0	0 **to** 0	0 **to** 0		
3	TF	N/A	0	0 **to** 0	0 **to** 0	0 **to** 0		
4	TF	N/A	0	0 **to** 0	0 **to** 0	0 **to** 0		

REM. * Weld layers are representative only - actual number pf passes and layer sequence may vary.

ML-1/2 projects or jobs must determine if the supporting documentation for this WPS complies with quality requirements of the project/job.

Use of LANL Welding Procedures and Welder Qualifications for non-LANL work shall be at the sole risk and responsibility of the Subcontractor, and the Subcontractor shall indemnify and save LANL and the Government harmless from any and all claims, demands, actions or causes of action, and for any expense or loss by the reason of Subcontractor's and their employees posession and use of LANL procedures and qualifications.

APPROVAL: Signatures on file at ES-FE   **DATE:**