

**Ex. 2 -Horizontal Directional Drills For Design Review
Sunoco Mariner 2 Project**



Factors For Selecting These HDDs

Sunoco considered a variety of screening factors in identifying HDDs for reevaluation. No one factor was dispositive. These factors included proximity to public and private water supplies, proximity to natural features (e.g. streams and wetlands) and the value of those natural features, proximity to man-made features (e.g. underground utilities and pipelines, railroad crossings), known impacts to rock from historic blasting, geologic conditions, depth of cover, and occurrence of inadvertent returns. In addition to these HDDs that will undergo reevaluation, Sunoco is reevaluating every HDD for the 16 inch line where there was an IR on the HDD for the proximate 20 inch line. In three cases there was an IR on the HDD for the 16 inch line and Sunoco will reevaluate the proximate 20 inch line for that HDD.

Data Review to Perform

In re-evaluating the design of the HDD techniques for the HDDs, Sunoco shall:

- (1) Re-examine the geology at each site using information and data gathered during HDD operations at that and other sites during construction of the pipeline subject to the permits in this Appeal.
- (2) Consider data that is specific to the needs of each HDD being reevaluated, including at a specific HDD, geologic strength at profile depth, overburden strength, HDD depth, entry angle, pipe stress radius, open cut alternatives, a re-route analysis for all HDDs (including those on this Exhibit) and analysis of well production zones.
- (3) Conduct, as appropriate, additional geotechnical evaluation at each site using techniques generally recognized within the scientific community which may include: (i) Additional field drilling and sampling; (ii) Seismic surveys; (iii) Ground penetrating radar; and (iv) electromagnetic surveys/electrical resistivity tomography.
- (4) In karst areas, Sunoco shall consider the use of seismic surveys and electromagnetic surveys/electrical resistivity tomography for the re-evaluation undertaken pursuant to this Order, and if it does not use these methodologies, it will provide the Department with an explanation for why they were not used at that site.

Construction					
	Spread	HDD Name	HDD #	PADEP 105 Permit HDD #	County
1	Spread 1	Wheeling and Lake Erie RR	S1B-0120	PA-WA-0171.0000-RR (20")	Washington
2	Spread 1	Gombach Road	S1B-0260	PA-WM1-0111.0000-RD (20")	Westmoreland
3	Spread 1	Hildebrand Road	S1B-0190	PA-WM1-0023.0000-RD (20")	Westmoreland
4	Spread 1	Norfolk Southern	S1B-0250	PA-WM1-0088.0000-RR (20")	Westmoreland
5	Spread 2	Goldfinch Lane	S2-0069	PA-CA-0016.0000-RD (20" &16")	Cambria
6	Spread 2	William Penn Ave (Route 271)	S2-0070	PA-CA-0023.0000-RD (20" &16")	Cambria
7	Spread 2	Wetland C-17	S2-0075	PA-CA-0047.0000-SR (20" &16")	Cambria
8	Spread 2	Spinner Road	S2-0080	PA-CA-0069.0000-RD (20" &16")	Cambria
9	Spread 3	Piney Creek	S2-0142	PA-BL-0126.0000-RD (20")	Blair
10	Spread 3	Juniata River	S2-0140	PA-BL-0122.0000-WX (20" &16")	Blair
11	Spread 3	Aughwick Creek	S2-0153	PA-HU-0078.0000-WX (20")	Huntingdon

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Spread					
12	Spread 3	Horse Valley	S2-0157	PA-PE-0002.0000-RD (20" &16")	Perry
13	Spread 4	Creek Rd	S2-0181	PA-CU-0125.0001-WX (20" &16")	Cumberland
14	Spread 4	Yellow Breeches Creek	S2-0250	PA-CU-0203.0000-WX (20" &16")	Cumberland
15	Spread 5	Wetland J-47	S3-0090	PA-LE-0001.0000-SR (20" &16")	Lebanon
16	Spread 5	Route 897	S3-0170	PA-LA-0024.0000-RD (20" &16")	Lancaster
17	Spread 6	N. Pottstown Pike	S3-0370	PA-CH-0212.0000-RD (20" &16")	Chester
18	Spread 6	Swedesford Rd	S3-0381	PA-CH-0219.0000-RD (20" &16")	Chester
19	Spread 6	Chester Rd	S3-0541	PA-CH-0421.0000-RD (20" &16")	Chester
20	Spread 6	Gradyville Rd	S3-0580	PA-DE-0032.0000-RD (20" &16")	Delaware
21	Spread 6	Valley Rd	S3-0591	PA-DE-0046.0000-RD (20" &16")	Delaware
22	Spread 6	Devon Dr. - Shoen Rd.	S3-0360	PA-CH-0199.0000-RD (16")	Chester
23	Spread 6	Eagleview Blvd.	S3-0321	PA-CH-0135.0000-RD (16")	Chester
24	Spread 5	Joanna Road	S3-0250	PA-BR-0181.0000-RD (20" & 16")	Berks
25	Spread 6	Bow Tree Drive	S3-0520	PA-CH-0413.0000-RD (20")	Chester