

Directional Survey Calculations	Measured Depth (ft)	Sub-Sea Incl. (deg)	Vertical Azim. (ft)	True Vert Depth (ft)	Northings (+) Southings (-) (ft)	Eastings (+) Westings (-) (ft)	Vert Section (ft)	DLS deg/100' (deg)	FNL	FSL	FWL	FEL
SHL	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5156	200	1251	4022
BHL	10034	88.30	2.20	5314.51	4823.49	-674.00	4870.30	0.00	330	5024	637	4628
Miss Entry	5634	70.49	337.54	5248.78	444.41	-625.22	524.04	7.69	4710	645	631	4641
Top Perf	5660	71.20	339.63	5257.31	467.27	-634.20	547.88	8.24	4687	668	622	4650
Bottom Perf	9915	88.61	2.01	5312.01	4704.64	-678.80	4753.16	0.85	449	4905	631	4634

Survey Points	X	Y	Surface XY	X	Y	North Line slope	m
NW Corner XY Coord	1780403	1768993				0.00284954	
SW Corner XY Coord	1780470	171540				-0.0141712	
NE Corner XY Coord	1785667	176908		1781718	171741	0.00094823	
SE Corner XY Coord	1785743	171545				-0.0125163	

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0	0.0	0	0	0	0	0	0	5156	200	1251	4022	
249	0.90	0.15	248.99	1.96	0.01	1.94	0.36	5154	202	1251	4022	
497	0.50	0.14	496.97	4.99	0.01	4.94	0.16	5151	205	1251	4022	
745	0.30	0.14	744.96	6.72	0.02	6.65	0.08	5149	207	1251	4022	
873	0.70	0.15	872.96	7.83	0.02	7.76	0.31	5148	208	1251	4022	
1029	0.00	260.80	1028.96	8.79	0.02	8.70	0.45	5147	209	1251	4022	
1487	0.20	48.40	1486.95	9.32	0.62	9.15	0.04	5146	209	1251	4021	
1964	0.40	103.30	1963.95	9.49	2.86	9.02	0.07	5146	209	1253	4019	
2441	0.40	162.90	2440.94	7.51	4.97	6.78	0.08	5148	207	1256	4017	
2916	0.50	109.80	2915.93	5.23	7.41	4.19	0.09	5151	205	1258	4015	
3394	0.00	336.70	3393.92	4.52	9.37	3.23	0.10	5151	204	1260	4013	
3870	0.20	56.40	3869.92	4.98	10.07	3.59	0.04	5151	205	1261	4012	
4061	0.40	214.60	4060.92	4.61	9.96	3.24	0.31	5151	204	1261	4012	
4156	0.40	205.90	4155.92	4.04	9.63	2.72	0.06	5152	204	1260	4013	
4219	0.20	181.10	4218.91	3.74	9.53	2.43	0.37	5152	204	1260	4013	
4251	0.20	240.90	4250.91	3.65	9.48	2.35	0.62	5152	203	1260	4013	
4283	1.90	312.40	4282.91	3.98	9.04	2.74	5.77	5152	204	1260	4013	
4315	3.70	329.70	4314.87	5.23	8.13	4.10	6.15	5151	205	1259	4014	
4346	5.40	324.70	4345.77	7.29	6.78	6.31	5.63	5148	207	1257	4015	
4378	7.40	317.30	4377.57	10.03	4.51	9.34	6.75	5146	210	1255	4018	
4410	9.10	312.90	4409.24	13.27	1.26	12.98	5.66	5142	213	1252	4021	
4442	10.90	306.40	4440.75	16.79	-3.03	17.04	6.63	5139	217	1248	4025	
4474	12.50	298.50	4472.09	20.23	-8.51	21.19	7.06	5135	220	1242	4030	
4505	14.80	288.40	4502.21	23.09	-15.21	24.91	10.66	5133	223	1236	4037	
4537	16.80	280.70	4533.01	25.23	-23.64	28.17	9.04	5130	225	1227	4046	
4569	18.50	277.90	4563.50	26.79	-33.21	30.99	5.94	5129	227	1218	4055	
4601	19.90	275.40	4593.72	28.00	-43.66	33.59	5.07	5128	228	1207	4065	
4632	21.90	271.00	4622.68	28.60	-54.70	35.66	8.20	5127	228	1196	4077	
4664	24.50	270.10	4652.09	28.72	-67.30	37.46	8.20	5127	229	1184	4089	
4696	26.20	272.30	4681.01	29.01	-81.00	39.58	6.07	5127	229	1170	4103	
4728	28.00	273.80	4709.50	29.79	-95.55	42.30	6.02	5126	230	1155	4117	
4759	30.80	275.50	4736.50	31.03	-110.72	45.56	9.42	5124	231	1140	4132	
4791	33.60	276.30	4763.58	32.79	-127.67	49.57	8.85	5123	233	1123	4149	
4823	35.80	278.30	4789.88	35.12	-145.74	54.29	7.74	5120	235	1105	4167	
4855	37.40	282.50	4815.58	38.57	-164.49	60.22	9.28	5117	239	1087	4186	
4887	39.10	287.10	4840.71	43.64	-183.63	67.81	10.36	5112	244	1067	4205	
4918	40.40	291.00	4864.55	50.12	-202.36	76.73	9.07	5105	250	1049	4224	
4950	42.60	295.20	4888.52	58.45	-221.84	87.59	11.08	5097	258	1029	4243	
4982	46.00	296.60	4911.42	68.22	-241.94	99.96	11.06	5087	268	1009	4263	
Top of Tangent @ 5030'	5013	49.60	297.70	4932.24	78.70	-262.37	113.08	11.91	5076	279	989	4283
	5045	51.30	298.20	4952.61	90.26	-284.16	127.46	5.45	5065	290	967	4305
	5077	51.60	298.10	4972.56	102.07	-306.23	142.11	0.97	5053	302	946	4327
	5109	51.70	298.10	4992.41	113.89	-328.36	156.78	0.31	5041	314	924	4349
	5141	52.00	299.40	5012.18	126.00	-350.43	171.73	3.33	5029	326	902	4371
Btm of Tangent @ 5204'	5172	52.40	300.80	5031.18	138.28	-371.62	186.74	3.79	5016	338	881	4392
	5204	53.40	302.80	5050.48	151.73	-393.30	202.97	5.88	5003	352	859	4413
	5236	54.70	304.90	5069.27	166.16	-414.81	220.15	6.69	4988	366	838	4435
	5267	55.90	308.00	5086.92	181.30	-435.31	237.89	9.09	4973	382	817	4455
	5299	56.50	310.60	5104.72	198.15	-455.88	257.33	7.01	4956	398	797	4475
	5331	58.00	313.80	5122.04	216.22	-475.81	277.92	9.63	4938	416	777	4495
	5363	60.10	317.20	5138.50	235.80	-495.03	299.89	11.23	4919	436	758	4514
	5394	62.30	319.80	5153.43	256.15	-513.02	322.46	10.22	4898	456	741	4532
	5426	64.00	322.60	5167.89	278.40	-530.91	346.90	9.44	4876	479	723	4549
	5458	65.20	325.00	5181.62	301.72	-547.98	372.30	7.74	4852	502	706	4566
	5490	65.50	327.40	5194.96	325.89	-564.15	398.41	6.88	4828	526	690	4582
	5521	66.10	330.00	5207.67	350.05	-578.84	424.31	7.89	4804	550	676	4596
	5553	67.80	332.40	5220.20	375.85	-593.02	451.78	8.71	4778	576	662	4610
	5585	69.20	334.10	5231.93	402.43	-606.42	479.92	6.60	4752	603	649	4623
	5617	70.00	336.00	5243.09	429.63	-619.07	508.56	6.10	4724	630	637	4635
	5648	70.90	338.80	5253.46	456.59	-630.29	536.78	8.99	4697	657	626	4646
	5680	71.70	341.00	5263.72	485.06	-640.70	566.38	6.98	4669	685	616	4656
	5712	73.30	342.90	5273.35	514.07	-650.16	596.40	7.55	4640	715	607	4665
	5744	76.00	344.20	5281.82	543.66	-658.89	626.90	9.30	4610	744	598	4673
	5775	78.60	345.20	5288.63	572.83	-666.87	656.87	8.96	4581	773	591	4681
	5807	79.70	347.10	5294.66	603.34	-674.39	688.11	6.77	4550	804	584	4688
	5839	80.60	348.70	5300.13	634.17	-681.00	719.55	5.67	4520	835	577	4694
	5871	81.80	350.10	5305.03	665.25	-686.82	751.13	5.72	4489	866	572	4700
	5902	84.00	351.10	5308.86	695.60	-691.84	781.88	7.79	4458	896	567	4704
	5934	86.50	353.10	5311.51	727.18	-696.22	813.76	9.99	4427	928	563	4708
	5966	87.80	355.00	5313.10	758.97	-699.53	845.70	7.19	4395	959	560	4711
	6022	88.70	354.90	5314.81	814.72	-704.46	901.62	1.62	4339	1015	556	4715
	6052	88.80	355.10	5315.46	844.60	-707.08	931.58	0.75	4309	1045	554	4717
	6083	89.20	356.20	5316.00	875.51	-709.43	962.52	3.78	4278	1076	552	4719

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6114	89.60	357.80	5316.33	906.46	-711.05	993.41	5.32	4247	1107	551	4720
6144	90.00	358.50	5316.43	936.45	-712.02	1023.26	2.69	4217	1137	550	4721
6175	90.00	357.80	5316.43	967.43	-713.02	1054.10	2.26	4186	1168	550	4722
6206	89.90	359.40	5316.46	998.42	-713.78	1084.91	5.17	4155	1199	549	4722
6237	89.60	0.10	5316.60	1029.42	-713.91	1115.65	2.46	4124	1230	549	4722
6267	89.80	359.50	5316.75	1059.42	-714.02	1145.39	2.11	4094	1260	550	4721
6298	90.00	359.50	5316.81	1090.42	-714.29	1176.15	0.65	4063	1291	550	4721
6329	90.60	359.60	5316.64	1121.42	-714.53	1206.90	1.96	4032	1322	550	4721
6360	91.20	0.30	5316.16	1152.41	-714.56	1237.62	2.97	4001	1353	550	4720
6391	91.50	0.50	5315.43	1183.40	-714.34	1268.31	1.16	3970	1384	551	4720
6421	91.70	0.60	5314.59	1213.39	-714.05	1297.99	0.75	3940	1414	552	4719
6452	91.70	0.80	5313.67	1244.37	-713.67	1328.64	0.64	3909	1445	552	4718
6483	91.80	0.60	5312.72	1275.36	-713.29	1359.29	0.72	3878	1476	553	4717
6514	92.10	0.20	5311.67	1306.34	-713.08	1389.97	1.61	3847	1507	554	4717
6544	92.40	0.30	5310.49	1336.31	-712.95	1419.66	1.05	3817	1537	554	4716
6575	91.20	0.20	5309.52	1367.30	-712.81	1450.35	3.88	3786	1568	555	4716
6605	90.60	0.60	5309.05	1397.29	-712.60	1480.04	2.40	3756	1598	555	4715
6636	90.90	1.00	5308.64	1428.29	-712.17	1510.70	1.61	3725	1629	556	4714
6667	91.20	1.20	5308.07	1459.28	-711.58	1541.33	1.16	3694	1660	557	4713
6698	90.10	1.70	5307.72	1490.26	-710.79	1571.94	3.90	3663	1691	558	4712
6730	90.30	2.40	5307.61	1522.24	-709.65	1603.48	2.28	3631	1723	560	4710
6762	90.50	2.00	5307.38	1554.22	-708.42	1635.00	1.40	3600	1755	562	4709
6794	89.50	2.50	5307.38	1586.19	-707.16	1666.52	3.49	3568	1787	563	4707
6826	87.90	3.90	5308.11	1618.13	-705.38	1697.93	6.64	3536	1819	565	4705
6858	87.70	3.80	5309.34	1650.04	-703.23	1729.26	0.70	3504	1851	568	4702
6890	89.50	3.70	5310.12	1681.96	-701.14	1760.62	5.63	3472	1882	570	4700
6922	91.00	5.20	5309.98	1713.86	-698.65	1791.90	6.63	3440	1914	573	4697
6954	91.20	5.30	5309.37	1745.72	-695.73	1823.08	0.70	3408	1946	577	4693
6985	91.00	4.60	5308.77	1776.60	-693.05	1853.33	2.35	3377	1977	580	4690
7017	91.30	4.60	5308.13	1808.49	-690.49	1884.59	0.94	3345	2009	583	4687
7049	89.80	4.10	5307.82	1840.39	-688.06	1915.88	4.94	3313	2041	585	4684
7081	89.40	4.10	5308.05	1872.31	-685.77	1947.21	1.25	3281	2073	588	4681
7113	89.60	4.10	5308.32	1904.23	-683.48	1978.53	0.62	3250	2105	591	4679
7145	90.10	4.50	5308.41	1936.14	-681.08	2009.83	2.00	3218	2137	594	4676
7177	90.70	4.30	5308.19	1968.04	-678.63	2041.12	1.98	3186	2169	597	4673
7209	90.50	3.40	5307.85	1999.97	-676.48	2072.47	2.88	3154	2200	599	4670
7241	90.20	3.20	5307.65	2031.92	-674.64	2103.89	1.13	3122	2232	601	4668
7273	90.80	3.90	5307.38	2063.85	-672.66	2135.27	2.88	3090	2264	604	4666
7304	91.40	3.70	5306.78	2094.78	-670.60	2166.65	2.04	3059	2295	606	4663
7336	91.50	2.10	5305.97	2126.73	-668.99	2197.09	5.01	3027	2327	608	4661
7368	92.00	1.40	5304.99	2158.70	-668.01	2228.64	2.69	2995	2359	610	4660
7400	92.20	0.80	5303.82	2190.67	-667.39	2260.25	1.98	2963	2391	611	4659
7432	91.60	1.10	5302.76	2222.65	-666.86	2291.86	2.10	2931	2423	611	4658
7464	91.30	1.20	5301.95	2254.63	-666.22	2323.47	0.99	2899	2455	613	4656
7496	90.60	1.10	5301.42	2286.62	-665.58	2355.09	2.21	2867	2487	614	4655
7528	90.90	0.90	5301.00	2318.61	-665.02	2386.72	1.13	2835	2519	615	4654
7560	90.50	1.10	5300.61	2350.60	-664.46	2418.35	1.40	2803	2551	615	4653
7592	89.20	0.70	5300.69	2382.60	-663.96	2449.99	4.25	2771	2583	616	4652
7624	89.00	359.20	5301.68	2414.59	-664.02	2481.62	2.40	2739	2615	617	4652
7656	89.00	359.50	5302.41	2446.58	-664.74	2513.26	1.19	2707	2647	617	4651
7688	89.20	0.10	5303.02	2478.57	-664.96	2544.91	1.22	2675	2679	618	4651
7720	89.20	1.20	5303.92	2510.56	-664.24	2576.56	1.72	2643	2711	619	4649
7752	89.30	0.80	5304.74	2542.55	-663.14	2608.21	0.65	2611	2743	621	4647
7784	89.30	0.30	5305.13	2574.54	-662.83	2639.86	1.56	2579	2775	622	4646
7816	89.70	360.00	5305.69	2606.53	-662.66	2671.51	0.78	2547	2807	623	4645
7848	89.70	0.10	5306.03	2638.52	-662.61	2703.16	0.16	2515	2839	624	4644
7880	90.00	0.20	5306.11	2670.51	-662.53	2734.81	0.99	2483	2871	624	4644
7912	90.20	359.70	5306.00	2702.50	-662.58	2766.46	0.84	2451	2903	625	4643
7944	89.30	359.80	5306.28	2734.49	-662.86	2798.11	1.41	2419	2935	625	4642
7976	88.90	359.50	5307.27	2766.48	-663.25	2829.76	0.79	2387	2967	626	4642
8008	89.10	359.60	5308.94	2798.47	-664.00	2861.41	0.23	2355	2999	626	4641
8040	89.60	358.80	5310.03	2830.46	-665.34	2893.06	0.98	2323	3031	626	4641
8072	89.80	358.30	5310.53	2862.45	-667.77	2924.71	0.56	2291	3063	625	4642
8104	90.20	357.90	5310.53	2894.44	-670.95	2956.36	0.59	2259	3095	623	4644
8136	90.20	357.40	5310.20	2926.43	-674.85	2988.01	0.53	2227	3127	620	4647
8168	90.50	357.40	5309.62	2958.42	-679.20	3019.66	0.31	2195	3159	617	4650
8200	90.40	357.80	5308.86	2990.41	-683.22	3051.31	0.43	2163	3191	614	4652
8232	89.40	357.90	5309.03	3022.40	-686.79	3082.96	1.06	2131	3223	612	4654
8264	88.70	358.10	5310.62	3054.39	-690.14	3114.61	0.76	2100	3255	610	4656
8296	88.50	357.40	5311.99	3086.38	-692.33	3146.26	1.30	2068	3287	608	4658
8328	89.00	358.00	5312.69	3118.37	-693.62	3177.91	2.44	2036	3319	607	4659
8360	89.80	359.00	5313.01	3150.36	-694.43	3209.56	4.13	2004	3351	607	4659
8392	90.20	0.10	5313.01	3182.35	-694.68	3241.21	3.66	1972	3383	607	4659
8424	90.30	0.90	5312.87	3214.34	-694.40	3272.86	2.52	1940	3415	608	4658
8456	91.30	1.70	5311.98	3246.33	-692.95	3304.51	2.00	1908	3447	610	4656
8488	90.90	1.80	5311.53	3278.32	-691.39	3336.16	0.85	1876	3479	612	4653
8520	90.10	1.40	5310.97	3310.31	-689.60	3367.81	1.40	1844	3511	615	4651
8552	90.00	1.60	5310.92	3342.30	-687.92	3399.46	0.35	1812	3543	617	4648
8584	90.80	1.30	5310.48	3374.29	-686.33	3431.11	1.36	1780	3575	620	4646
8616	90.00	1.60	5309.81	3406.28	-683.90	3462.76	0.89	1748	3607	623	4642
8648	89.10	1.80	5310.55	3438.27	-681.08	3494.41	0.97	1716	3639	627	4638
8680	88.40	2.10	5312.62	3470.26	-677.85	3526.06	0.80	1684	3671	632	4633
8712	88.30	2.20	5312.91	3502.25	-676.07	3557.71	0.38	1652	3703	634	4631
TD	10034	88.30	5314.51	4823.49	-674.00	4870.30	0.00	330	5024	637	4628