APPENDIX B
Construction Assumptions

EWVIS – Draft EIR – EQUIPMENT AND CONSTRUCTION ASSUMPTIONS

January 10, 2019

Equipment	Number of Pieces	Percent Usage (each)	HP (each) or other info
Force Main			
Excavation and Shoring			
Concrete Saw	1	0.60	60 hp
Pavement Breaker	1	0.60	100 hp
Loader	2	0.60	150 hp
Drill Rig/Auger	2	0.60	150 hp
Service Crane	2	0.50	250 hp
Excavator	1	0.80	162 hp
Generator- PwrTools	1	0.80	50 hp
Generator- Vent. Fans	1	0.80	50 hp
Compressor- PwrTools	1	0.80	50 hp
Forklift	1	0.50	90 hp
Sweeper	1	0.20	200 hp
Pumping Equipment (GW)	2	0.50	50 hp
Workers	24		
Haul Trips -net export	9[1]		
Haul Trips – staging areas	11		
Supply Trips - materials[2]	10		
Concrete or Gravel Truck	4[3]		
Bedding			
Loader	2	0.40	150 hp
Workers	6		
Generator- Vent. Fans	1	0.80	50 hp
Supply Trips (materials)	6[4]		
Pipe Laying			
Service Crane	1	0.50	250 hp
Loader	1	0.30	150 hp
Generator w/PwrTools	1	0.80	50 hp

[1] Peak

[2] H-BEAM ASSUMPTIONS (10”*12”*5/8”*20’): Weight assumption: 1400 lbs per beam, Truck load weight: ~30000lbs, Beams per load: 22, 50’/100’day = 22/44 H-Beams (SPAN = 5’): **Avg daily Beam trips = 22/22 = 1 and Peak daily beam trips = 44/22 = 2.** STEEL PLATE ASSUMPTIONS (5x8x1”): Weight assumption: 1650 lbs per beam, Truck load weight: ~30000lbs, Plates per load: 18 (span=5’), 50’/100’day = 40/80 Plates: **Avg Daily Plate Trips = 40/18 =2.2 and Plate Peak Daily Trips = 80/18 = 4.4.** COVER PLATE ASSUMPTIONS (5x10x1”): Weight assumption: 2050 lbs per beam, Truck load weight: ~30000lbs, Plates per load: 15, 50’/100’day = 10/20 Plates: **Avg Daily Plate Trips = 10/15 =0.6 and Plate Peak Daily Trips = 20/15 = 1.3.** K RAIL ASSUMPTIONS (10’*2’*2.5’): Weight assumption: 4000 lbs per Rail, Truck load weight: ~30000lbs, K Rails per load: 8 (SPAN = 10’), 50’/100’day = 10/20 K-Rails: **Avg daily K-Rail trips = 10/8 = 1.25 and Peak daily K-Rail trips = 20/8 = 2.5**

[3]Concrete/Gravel to Lock Beams; Beam Span = 5’, Peak = 44 piles, Avg = 22 piles, D=1.5' Depth=20', Drill hole volume = (Pi(R*R)*20)/27 = (3.14156 *.75*.75*20)/27 =1.3 cy: **Avg Trips = (1.3*22) /20 = 35.2/20 = 1.4 trips and Peak Trips = (1.3*44)/20 = 57.2/20 = 2.9 Trips**

[4] Worst Case Force Main supply trips from EWVIS Excel Spreadsheet

Equipment	Number of Pieces	Percent Usage (each)	HP (each) or other info
Generator- Vent. Fans	1	0.80	50 hp
Compressor w/PwrTools	1	0.80	50 hp
Workers	10		
Supply Trips (materials)	2[5]		
Testing			
Compressor	1	1.00	50 hp
Water Truck	1	0.40	150 hp
Pumping Equipment	1	0.80	100 hp
Workers	5		
Supply Trips (misc)	1		
Restoration			
Loader	2	0.50	150 hp
Generator w/PwrTools	1	0.80	50 hp
Generator- Vent. Fans	1	0.80	50 hp
Compressor w/PwrTools	1	0.80	50 hp
Soil Compacter	1	0.80	100 hp
Roller	1	0.80	90 hp
Sweeper	1	0.20	150 hp
Asphalt Paver	1	0.40	100 hp
Workers	12		
Haul Trips (staging)	11[6]		
Supply Trips (other)	6[7]		
Supply Trips (asphalt)	3[8]		
Pump Stations (Each)			
Excavation and Shoring			
Concrete Saw	1	0.20	60 hp
Pavement Breaker	1	0.30	100 hp
Loader	1	0.80	150 hp
Drill Rig/Auger	1	0.30	150 hp
Service Crane	1	0.30	250 hp
Concrete Pump	1	0.80	100 hp
Excavator	1	0.60	162 hp
Generator w/PwrTools	1	0.80	50 hp
Generator- Vent. Fans	1	0.80	50 hp
Compressor w/PwrTools	1	0.80	50 hp

[5] DIP - 20 feet, weight assumption: 24" = 2540 lbs US Pipes, 30" = 3560, 36" = 4935, 42" = 6650, truck load weight: ~30,000 lbs, 24" Pipes per load: 12, 30" Pipes per load: 8, 36" Pipes per load: 6, 42" Pipes per load: 4: **Peak = 100'=5 pipes = <1.25 trips and Avg = 50'=2.5 pipes = <.625 trip**

[6] Same info as Hauling to/from Staging Areas under Excavation/Shoring

[7] Other trips associated with special circumstances, such as concrete encasing of pipe segment in eastern portion of the alignment

[8] Worst Case Asphalt/Base Trips from EWVIS Excel Spreadsheet

Equipment	Number of Pieces	Percent Usage (each)	HP (each) or other info
Forklift	1	0.50	90 hp
Sweeper	1	0.20	150 hp
Pumping Equipment	1	0.50	50 hp
Workers	22		
Haul Trips (net export) Pump Stations	19[9]		
Supply Trips (materials) Pump Stations	8[10]		
Gravel Trips Pump Stations	6[11]		
Formwork and Casting			
Concrete Pump	1	0.60	100 hp
Forklift	1	0.20	90 hp
Compressor w/PwrTools	1	0.80	50 hp
Generator- Vent. Fans	1	0.80	50 hp
Workers	12		
Supply Trips Pump Stations	4[12]		
Concrete Trips Pump Stations	11[13]		
Equipment Installation			
Service Crane	1	0.20	250 hp
Forklift	1	0.20	90 hp
Generator w/PwrTools	1	0.80	50 hp
Generator- Vent. Fans	1	0.80	50 hp
Compressor w/PwrTools	1	0.80	50 hp
Workers	10		

[9] Worst Case Daily Haul Trips from EWVIS Excel Spreadsheet

[10] Worst Case pit: 28*12*33, H-BEAM ASSUMPTIONS: 304mm x 360mm x 25.4mm 12M, Weight assumption: 4740 lbs per beam, Truck load weight: ~30000lbs, Beams per load: 6, (SPAN = 4'), Beams needed for Pit = 20: **Trips: 2** (20/6=3.3). STEEL PLATE ASSUMPTIONS 4x9'*1": Weight assumption: 1470 lbs per beam, Truck load weight: ~30000lbs, Plates per load: 20 (Span=4'), Plates needed per pit: 80: **Daily Trips: 4** (80/20=4). K RAIL ASSUMPTIONS (10'*2'*2.5'): Weight assumption: 4000 lbs per Rail, Truck load weight: ~30000lbs, K Rails per load: 8 (SPAN = 10'), 10 K-Rails for Pit Barrier: **Daily K-Rail trips = 1.25 (=10/8).** FENCING and MISC: **Daily Misc Trips: 1**

[11] Concrete/Gravel to lock piles, 16 piles, D=2' Lock Depth=40' Swell = 1.21, Drill hole volume=(Pi(R*R)*40*1.21)/27 = (3.14156 *1*1*40*1.21)/27 =5.6 cy: Trips = (5.6*20) /20 = 89.6/20 = **5.6 trips**

[12] 1 trip each lumber for formwork, rebar, plumbing, electrical

[13] Based on Typ PS in M-01 using 1' thick walls, & .3' top+, rounded up. Whitsett PS is deepest and is used. Wall-1: 17*1*34, Wall-2: 15*1*34, Wall-3: 17*1*34, Wall-4: 15*1*34, Floor: 15*15*1, Wall-5: 16*5*1, Wall-6: 16*5*1, Wall-7: 14*5*1, Floor: 16*12*.3, Top: (17*17*.3) + (14*14*.3), Total CF=2847, CY=~105, rounded to 110: Trips based on 10cy truck capacity, Trips = 110/10 = 11

Equipment	Number of Pieces	Percent Usage (each)	HP (each) or other info
Supply Trips Pump Station	4[14]		
Restoration			
Service Crane	1	0.40	250 hp
Loader	1	0.60	150 hp
Generator w/PwrTools	1	0.80	50 hp
Generator- Vent. Fans	1	0.80	50 hp
Compressor w/PwrTools	1	0.80	50 hp
Soil Compacter	1	0.80	100 hp
Roller	1	0.20	90 hp
Sweeper	1	0.20	150 hp
Workers	6		
Haul Trips (staging) Pump Station	1[15]		
Haul Trips (shoring) Pump Station	8[16]		
Concrete Trips Pump Station	2[17]		
Diversion Structures (Each)			
Excavation and Shoring			
Concrete Saw	1	0.20	60 hp
Pavement Breaker	1	0.30	100 hp
Loader	1	0.80	150 hp
Drill Rig/Auger	1	0.30	150 hp
Service Crane	1	0.30	250 hp
Concrete Pump	1	0.80	100 hp
Excavator	1	0.60	162 hp
Generator w/PwrTools	1	0.80	50 hp
Generator- Vent. Fans	1	0.80	50 hp
Compressor w/PwrTools	1	0.80	50 hp
Forklift	1	0.50	90 hp
Sweeper	1	0.20	150 hp
Pumping Equipment (tie ins)	1	0.50	50 hp
Workers	22		
Haul Trips -net export Diversions	3[18]		

[14] 1 trip each for pumps, plumbing, electrical, misc

[15] Minor filling

[16] Shoring haul away – same as shoring supply trips

[17] Concrete and Misc

[18]Worst Case for Net Soil Export – Peak from EWVIS Excel Spreadsheet

Equipment	Number of Pieces	Percent Usage (each)	HP (each) or other info
Haul Trips -staging Diversions	7[19]		
Supply Trips -materials Diversions	5[20]		
Gravel Trips Diversions	2[21]		
Formwork and Casting			
Concrete Pump	1	0.60	100 hp
Forklift	1	0.20	90 hp
Compressor w/PwrTools	1	0.80	50 hp
Generator- Vent. Fans	1	0.80	50 hp
Workers	12		
Supply Trips Diversions	3[22]		
Concrete Trips Diversions	1		
Equipment Installation			
Service Crane	1	0.20	250 hp
Forklift	1	0.20	90 hp
Generator w/PwrTools	1	0.80	50 hp
Generator- Vent. Fans	1	0.80	50 hp
Compressor w/PwrTools	1	0.80	50 hp
Workers	10		
Supply Trips Diversions	3[23]		
Restoration			
Service Crane	1	0.40	250 hp
Loader	1	0.60	150 hp
Generator w/PwrTools	1	0.80	50 hp
Generator- Vent. Fans	1	0.80	50 hp
Compressor w/PwrTools	1	0.80	50 hp

[19] Worst Case for Peak Daily Haul Trips to/from Staging Areas from EWVIS Excel Spreadsheet

[20] H-BEAM ASSUMPTIONS 300mm x 360mm x 6M: Weight assumption: 2370 lbs per beam, Truck load weight: 30000lbs, Beams per load: 12, Beams needed for Pit = 16: Daily Trips: 1.3 (16/12=1.3)
STEEL PLATE ASSUMPTIONS 4x9': Weight assumption: 1470 lbs per beam, Truck load weight: ~30000lbs, Plates per load: 20, Plates needed per pit: 32, Daily Trips: 1.6 (32/20)
K RAIL ASSUMPTIONS (10'*2'*2.5'): Weight assumption: 4000 lbs per Rail, Truck load weight: ~30000lbs, K Rails per load: 8 (SPAN = 10'), 8 K-Rails for Pit Barrier: Daily K-Rail trips = 8/8 = 1
FENCING and MISC: Daily Misc Trips: 1
Total Daily Trips (WC) = 4.9

[21] Concrete/Gravel to lock piles: 16 piles, D=2' Lock Depth=20', Drill hole volume= (Pi(R*R)*20)/27 = (3.14156 *1*1*20)/27 =2.3cy: **Trips = (2.3*16) /20 = 1.8 trips, Daily Misc Trips: 1: Total daily Trips=2.8**

[22] 1 trip each lumber for formwork, rebar, electrical

[23] 1 trip each gate gear, misc

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Equipment	Number of Pieces	Percent Usage (each)	HP (each) or other info
Soil Compacter	1	0.80	100 hp
Roller	1	0.20	90 hp
Sweeper	1	0.20	150 hp
Workers	6		
Haul Trips (staging) Diversions	7		
Haul Trips (shoring) Diversions	3		
Supply Trips (asphalt) Diversions	2[24]		
Junction to EVIS			
Excavation and Shoring			
Concrete Saw	1	0.20	60 hp
Pavement Breaker	1	0.30	100 hp
Loader	2	0.40	150 hp
Drill Rig	2	0.30	150 hp
Large Crane	1	0.30	350 hp
Concrete Pump	1	0.80	100 hp
Excavator	1	0.80	162 hp
Generator w/PwrTools	1	0.80	50 hp
Generator- Vent. Fans	2	0.80	50 hp
Compressor w/PwrTools	1	0.80	50 hp
Forklift	1	0.50	90 hp
Sweeper	1	0.20	150 hp
Pumping Equipment	2	0.50	75 hp
Workers	25		
Haul Trips – staging	14[25]		
Haul Trips - net export	4		
Supply Trips - materials	22[26]		
Concrete or Gravel Trips	3[27]		
Formwork and Casting			

[24] Vol asphalt/truck capacity: (L * W * D)/27/10cy truck, (16*16*1)/27/10, Asphalt Trips =.95, Misc Trips=1: Total Daily" 1.95 trips

[25] Total and Peak Daily Haul Trips to/from Staging Areas from EWVIS Excel Spreadsheet

[26] H-BEAM ASSUMPTIONS 400mm x 500mm x 25.4mm x 18M: Weight assumption: 10000 lbs per beam, Truck load weight: ~30000 lbs, Beams per load: 3, Span = 4', Beams needed for shaft = 32, Trips: 10.6 (=32/3)
STEEL PLATE ASSUMPTIONS 4x8': Weight assumption: 1310 lbs per beam, Truck load weight: ~30000lbs, Plates per load: 23, Plates needed per pit: 192: Trips: 8.4 (192/23=8.4)
K RAIL ASSUMPTIONS (10'*2'*2.5'): Weight assumption: 4000 lbs per Rail, Truck load weight: ~30000lbs, K Rails per load: 8 (SPAN = 10'), Rails needed: 16, Daily K-Rail trips = 16/8 = 2
Misc Daily Supply Trips: 1
Total Daily Trips: 22

[27] Concrete/Gravel to lock piles: 192 piles, D=2.5' Lock Depth=60', Drill hole volume= (Pi(R*R)*60*)/27 = (3.14156 *1.25*1.25*60)/27, =11 cy, TOTAL Trips = 106 (=11*192 /20), 5 piles per day: Daily Trips = **2.75 trips** (55 cy/20)

Equipment	Number of Pieces	Percent Usage (each)	HP (each) or other info
Large Crane	1	0.30	350 hp
Forklift	1	0.30	90 hp
Concrete Pump	1	0.80	100 hp
Generator w/PwrTools	1	0.80	50 hp
Generator- Vent. Fans	1	0.80	50 hp
Compressor w/PwrTools	1	0.80	50 hp
Workers	15		
Supply Truck	3[28]		
Concrete Truck	16[29]		
Equipment Installation			
Large Crane	1	0.30	350 hp
Forklift	1	0.40	90 hp
Generator w/PwrTools	1	0.80	50 hp
Generator- Vent. Fans	1	0.80	50 hp
Compressor w/PwrTools	1	0.80	50 hp
Workers	10		
Supply Truck	1[30]		
Restoration			
Large Crane	1	0.50	350 hp
Loader	1	0.60	150 hp
Generator w/PwrTools	1	0.80	50 hp
Generator- Vent. Fans	1	0.80	50 hp
Soil Compacter	1	0.80	100 hp
Roller	1	0.80	90 hp
Sweeper	1	0.20	150 hp
Workers	12		
Haul Trips (staging)	14[31]		
Haul Trips (shoring)	22		
Supply Trips (base)	4		
Supply Trips (for concrete structure)	11		
Supply Trips (asphalt)	4[32]		
Connecting Sewers (Each)			
Excavation and Shoring			
Concrete Saw	1	0.50	60 hp

[28] 1 ea for lumber and rebar, Misc

[29] Based on Figure 5.4 of Concept Report. Assumes Junction encasement is 1' thick. Concrete Vol = EVIS encasement vol + EWVIS encasement Vol. EVIS outer cylinder OD (96" + 12" +12") - inner cylinder OD (84"+6"+6") + EWVIS outer cylinder (44.5" + 12" + 12") – inner cylinder (44.5") =(3.14156*5*5*28) – (3.14156*4*4*28) + (3.14156*2.85*2.85*20) – (3.14156*1.85*1.85*20) =2199.1 – 1407.4 + 510.3 – 215 = 4332 cf / 27 = 160.45cy **Total Trips = 16** (160.45/10)

[30] Monitoring equipment or misc

[31] Total and Peak Daily Haul Trips to/from Staging Areas from EWVIS Excel Spreadsheet

[32] Vol asphalt/truck capacity: (L * W * D)/27/10cy truck, (30*30*1)/27/10 =3.3

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Equipment	Number of Pieces	Percent Usage (each)	HP (each) or other info
Pavement Breaker	1	0.50	100 hp
Loader	1	0.50	150 hp
Drill Rig/Auger	2	0.60	150 hp
Service Crane	2	0.40	250 hp
Excavator	1	0.80	162 hp
Generator w/PwrTools	1	0.80	50 hp
Generator- Vent. Fans	1	0.80	50 hp
Compressor w/PwrTools	1	0.80	50 hp
Forklift	1	0.50	90 hp
Sweeper	1	0.20	150 hp
Pumping Equipment	2	0.50	50 hp
Workers	16		
Haul Truck -net export	4[33]		
Haul Truck –staging	15[34] peak day		
Supply Truck (materials)	10[35]		
Concrete or Gravel Truck			
Bedding			
Loader	1	0.50	150 hp
Generator- Vent. Fans	1	0.80	50 hp
Workers	6		
Supply Trips	3[36]		
Pipe Laying			
Service Crane	1	0.50	250 hp
Loader	1	0.30	150 hp
Generator w/PwrTools	1	0.80	50 hp
Generator- Vent. Fans	1	0.80	50 hp
Compressor w/PwrTools	1	0.80	50 hp
Workers	8		
Supply Trips	1		
Restoration			

[33] Daily Haul Trips for Net Soil Export from EWVIS Excel Spreadsheet

[34]Peak Daily Trips to/from Staging Areas from EWVIS Excel Spreadsheet

[35] H-BEAM ASSUMPTIONS: (10"*12"*5/8"*20'), Weight assumption: 1400 lbs per beam, Truck load weight: 30000lbs, Beams per load: 22 (SPAN = 5'), **Peak Daily Trips: 2 (44/22=2), H-Beam Peak Daily Trips: 2 (44/22=2)**
STEEL PLATE ASSUMPTIONS (5x8x1"): Weight assumption: 1650 lbs per beam, Truck load weight: 30000lbs, Plates per load: 18 (span=8': 80 feet/day, **Plate Peak Daily Trips: 4.4 (80/18=4.4)**
K RAIL ASSUMPTIONS (10'*2'*2.5'): Weight assumption: 4000 lbs per Rail, Truck load weight: ~30000lbs, K Rails per load: 8 (SPAN = 10'), 100'day = 20 K-Rails: **Daily K-Rail trips = 20/8 = 2.5**
COVER PLATE ASSUMPTIONS (5x10x1"): Weight assumption: 2050 lbs per beam, Truck load weight: ~30000lbs, Plates per load: 15, 100'day = 20 Plates, **Plate Daily Trips = 20/15 = 1.3**
DAILY SUPPLY TRIPS: 10.2

[36] Concrete/Gravel to Lock Beams: Beam Span = 5', Peak = 44 piles, D=1.5' Depth=20', Drill hole volume = (Pi(R*R)*20)/27 = (3.14156 *.75*.75*20)/27 =1.3 cy: **Peak Trips = (1.3*44)/20 = 57.2/20 = 2.9 Trips**

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Equipment	Number of Pieces	Percent Usage (each)	HP (each) or other info
Loader	1	0.40	150 hp
Generator w/PwrTools	1	0.80	50 hp
Generator- Vent. Fans	1	0.80	50 hp
Soil Compacter	1	0.80	100 hp
Roller	1	0.80	90 hp
Sweeper	1	0.20	150 hp
Asphalt Paver	1	0.50	100 hp
Workers	12		
Haul Truck (staging)	15[37] peak day		
Haul Truck (shoring)	9		
Supply Trips (asphalt)	2[38]		
Concrete Trips	1		
Microtunneling (Each)			
Excavation and Shoring			
Concrete Saw	1	0.20	60 hp
Pavement Breaker	1	0.30	100 hp
Loader	1	0.80	150 hp
Drill Rig/Auger	1	0.60	150 hp
Service Crane	1	0.30	250 hp
Excavator	1	0.60	162 hp
Generator w/PwrTools	1	0.80	50 hp
Generator- Vent. Fans	1	0.80	50 hp
Compressor w/PwrTools	1	0.80	50 hp
Forklift	1	0.50	90 hp
Sweeper	1	0.20	150 hp
GW Pumping Equipment	2	0.50	75 hp
Workers	22		
Haul Trips -staging	34[39]		
Supply Trips - materials	17[40]		

[37] Peak Daily Trips to/from Staging Areas from EWVIS Excel Spreadsheet

[38] Vol asphalt/truck capacity: (L * W * D)/27/10cy truck, (4*100*1)/27/10 =1.4

[39] Worst Case Daily Haul Trips from EWVIS Excel Spreadsheet

[40] Pit Dimensions (WC): 20*30*50, H-BEAM ASSUMPTIONS 400mm x 500mm x 25.4mm x 18M, Weight assumption: 10000 lbs per beam, Truck load weight: ~30000 lbs, Beams per load: 3, Span = 4', Beams needed for shaft = 24, Trips: 8 (=24/3)

STEEL PLATE ASSUMPTIONS 4x9', Weight assumption: 1840 lbs per beam, Truck load weight: ~30000lbs, Plates per load: 23, Plates needed per pit: 144, Trips: 6.3 (144/23=6.3)

K RAIL ASSUMPTIONS (10'*2'*2.5'), Weight assumption: 4000 lbs per Rail, Truck load weight: ~30000lbs, K Rails per load: 8 (SPAN = 10'), Rails needed: 12, Daily K-Rail trips = 12/8 = 1.5

Misc Daily Supply Trips: 1

Total Daily Trips: 16.8

Equipment	Number of Pieces	Percent Usage (each)	HP (each) or other info
Concrete or Gravel Trips	3[41]		
Pipe Installation			
Large Crane	1	0.40	350 hp
Loader	1	0.40	150 hp
Generator w/PwrTools	1	0.80	50 hp
Generator- Vent. Fans	1	0.80	50 hp
Compressor w/PwrTools	1	0.80	50 hp
Tunnel Boring Machine	1	0.80	250 hp
Slurry Pumps	3	0.80	75 hp
Slurry Mixing/Separation	1	0.80	75 hp
Hydraulic Jack System	1	0.4	75 hp
Water Truck	1	0.4	150 hp
Workers	12		
Haul Trips (daily) – soil	3		
Supply Trips	3[42]		
Restoration			
Large Crane	1	0.40	350 hp
Loader	1	0.60	150 hp
Generator w/PwrTools	1	0.80	50 hp
Generator- Vent. Fans	1	0.80	50 hp
Soil Compacter	1	0.80	100 hp
Roller	1	0.80	90 hp
Sweeper	1	0.20	150 hp
Workers	12		
Supply Trips (asphalt)	3[43]		
Supply Trips (access structures)	6[44]		
Haul Trips (staging)	34		

Concrete/Gravel to lock piles: 144 piles, D=2.5' Lock Depth=60', Drill hole volume = (Pi(R*R)*60*)/27 = (3.14156 *1.25*1.25*60)/27 =11 cy: TOTAL Trips = 79.2 (=11*144 /20), 5 piles per day: **Daily Trips = 2.75 trips** (55 cy/20)[41]

[42] RCP - 16 feet, weight assumption: Rinker, 42" = 745 lbs/ft = 11,920 per pipe, truck load weight: ~30,000 lbs, Pipes per Trip: 2, **Daily Trips = ~50'=3 pipes = 3/2 = 1.5 trips**, Slurry - Bentonite: Assume 1 truck trip per day during pipe installation. **Daily Trips: 2.5**

[43]Vol asphalt/truck capacity: (L * W * D)/27/10cy truck, (20*30*1)/27/10=**2.2**

[44] Assumes pre-cast access structure segments

	Month Start	Finish	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Mobilization																																
Force Main- Open Cut - Work Segment 1																																
Excavation and Shoring																																
Bedding																																
Pipe Laying																																
Testing																																
Restoration																																
Force Main- Open Cut - Work Segment 2																																
Excavation and Shoring																																
Bedding																																
Pipe Laying																																
Testing																																
Restoration																																
Pump Station - Vineland																																
Excavation and Shoring																																
Formwork and Casting																																
Equipment Installation																																
Restoration																																
Pump Station - Tujunga																																
Excavation and Shoring																																
Formwork and Casting																																
Equipment Installation																																
Restoration																																
Pump Station - Lankershim																																
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	Month Start	Finish	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
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Junction - EVIS																																
Excavation and Shoring																																

	Month Start	Finish	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
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Connecting Sewer - Vineland																																
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Pipe Installation																																
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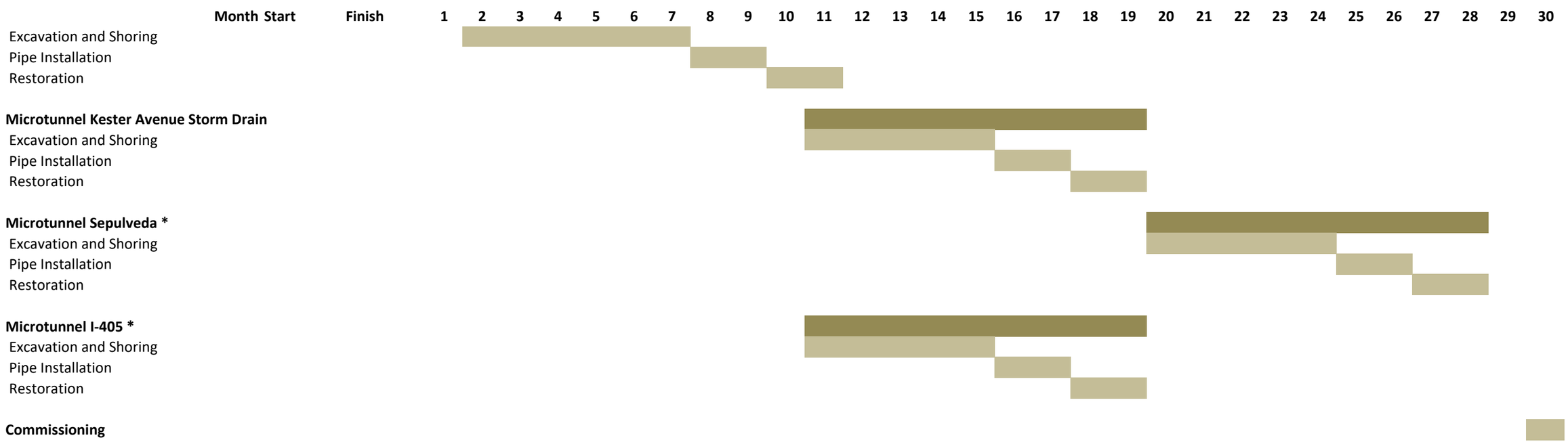
Microtunnel Tujunga Wash																																


Month Start
Finish
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Excavation and Shoring
Pipe Installation
Restoration
Microtunnel Kester Avenue Storm Drain
Excavation and Shoring
Pipe Installation
Restoration
Microtunnel Sepulveda *
Excavation and Shoring
Pipe Installation
Restoration
Microtunnel I-405 *
Excavation and Shoring
Pipe Installation
Restoration
Commissioning
* Optional
Top Task
More detailed associated with top task

Force Main

Pipe OD Inches	Trench Width	Trench Avg. Depth	Trench Length	Displaced Volume (cf)	Displaced Volume (cy)	Swell Factor	Total Volume	Haul Truck Capacity	Daily Haul trucks	Peak Daily Haul Trips to/from Staging Area	Avg Daily Haul Trips to/from Staging Area	Pipe Vol (cf)	Pipe Vol (cy)	Base Depth	Base Vol (cf)	Base Vol (cy)	Net Soil Export Haul (CY)	Net Soil Export peak Daily Haul Trips	NetExp Avg Daily Haul Trips	Supply Trips Base	Asphalt/Base Trips
26	4	14	100	5600	207.4	1.21	251	20	12.5	6.3		368.7	14	4.17	1298	48	75	3.7		2.4	1.5
26	4	14	50	2800	103.7	1.21	125	20	6.3		3.1	184.3	7	4.17	649	24	37		1.9	1.2	0.7
32	5	14	100	7000	259.3	1.21	314	20	15.7	7.8		558.5	21	4.67	1775	66	105	5.2		3.3	1.9
32	5	14	50	3500	129.6	1.21	157	20	7.8		3.9	279.2	10	4.67	887	33	52		2.6	1.6	0.9
38.5	6	14	100	8400	311.1	1.21	376	20	18.8	9.4		808.4	30	5.21	2317	86	140	7.0		4.3	2.2
38.5	6	14	50	4200	155.6	1.21	188	20	9.4		4.7	404.2	15	5.21	1158	43	70		3.5	1.0	1.1
44.5	7	14	100	9800	363.0	1.21	439	20	22.0	11.0		1,080.0	40	5.71	2916	108	179	9.0		5.4	2.6
44.5	7	14	50	4900	181.5	1.21	220	20	11.0		5.5	540.0	20	5.71	1458	54	90		4.5	2.7	1.3

Diversions

	Pit Width	Pit Avg. Depth	Pit Length	Displaced Volume (cf)	Displaced Volume (cy)	Swell Factor	Total Volume	Haul Truck Capacity	Total Haul trucks	Peak Daily Haul Trips to/from Staging Area	Tot. Base Vol (cf)	Tot. Base Vol (cy)	Net Soil Export Tot. Haul (CY)	Net Soil Exp peak Daily Haul Trips
Vineland	16	14	16	3584	132.7	1.21	161	20	8.0	5.7	1024	38	46	2.3
Tujunga	16	16	16	4096	151.7	1.21	184	20	9.2	6.9	1024	38	46	2.3
Lankershim	16	16	16	4096	151.7	1.21	184	20	9.2	6.9	1024	38	46	2.3
Laurel	16	15	16	3840	142.2	1.21	172	20	8.6	6.3	1024	38	46	2.3
Whitsett	16	16	16	4096	151.7	1.21	184	20	9.2	6.9	1024	38	46	2.3
Fulton	16	15	16	3840	142.2	1.21	172	20	8.6	6.3	1024	38	46	2.3
EVIS Junction	30	45	30	40500	1500.0	1.21	1815	20	90.8	14.1	9000	333	403	4.0

Connecting Sewer

	Pipe OD "	Trench Width	Trench Avg. Depth	Total Trench Length	Displaced Volume (cf)	Displaced Volume (cy)	Swell Factor	Total Volume	Haul Truck Capacity	Total Haul trucks	Peak Daily Haul trucks	Avg Daily Haul trucks	Tot. Pipe Vol (cf)	Tot. Pipe Vol (cy)	Base Depth	Tot. Base Vol (cf)	Tot. Base Vol (cy)	Net Export Tot. Haul (CY)	Net Soil Exp peak Daily Haul Trips
Vineland	30	4	14	300	16800	622.2	1.21	753	20	37.6	12.5	6.3	1,472.6	55	4.50	3927	145	242	4.0
Tujunga	20	4	16	100	6400	237.0	1.21	287	20	14.3	14.3	7.2	218.2	8	3.67	1249	46	66	3.3
Lankershim	23	4	16	200	12800	474.1	1.21	574	20	28.7	14.3	7.2	577.0	21	3.92	2556	95	140	3.5
Laurel	26.5	4	15	140	8400	311.1	1.21	376	20	18.8	13.4	6.7	536.2	20	4.21	1820	67	106	3.8
Whitsett	26.5	4	16	390	24960	924.4	1.21	1119	20	55.9	14.3	7.2	1,493.8	55	4.21	5071	188	294	3.8
Fulton	26.5	4	15	610	36600	1355.6	1.21	1640	20	82.0	13.4	6.7	2,336.4	87	4.21	7932	294	460	3.8

Pump Stations

	Pit Width	Pit Avg. Depth	Pit Length	Displaced Volume (cf)	Displaced Volume (cy)	Swell Factor	Total Volume	Haul Truck Capacity	Total Haul trucks	Peak Daily Haul Trips to Inert LF or other End use	Typ. PS Conc. Vol (cy	Typ PS Trips	Daily Haul trucks
Vineland	35	31	15	16275	602.8	1.21	729	20	36.5	18.2			18.2
Tujunga	26	30	12	9360	346.7	1.21	419	20	21.0	10.5			10.5
Lankershim	29	33	13	12441	460.8	1.21	558	20	27.9	13.9			13.9
Laurel	27	26	12	8424	312.0	1.21	378	20	18.9	9.4			9.4
Whitsett	28	30	12	10080	373.3	1.21	452	20	22.6	11.3	110.0	11	11.3
Fulton	28	30	12	10080	373.3	1.21	452	20	22.6	11.3			11.3

Microtunnel Pit

	Pit Width	Pit Avg. Depth	Pit Length	Displaced Volume (cf)	Displaced Volume (cy)	Swell Factor	Total Volume	Haul Truck Capacity	Total Haul trucks	Daily Haul trucks
SR170	20	16	30	9600	355.6	1.21	430	20	21.5	10.8
Tujunga Wash	20	50	30	30000	1111.1	1.21	1344	20	67.2	33.6
Kester	20	26	30	15600	577.8	1.21	699	20	35.0	17.5

Tunnel Spoils

	Pipe Radius	Pit	Pipe Install Length	Displaced Volume (cf)	Displaced Volume (cy)	Swell Factor	Total Volume	Haul Truck Capacity	Total Haul trucks	Daily Haul trucks
SR170	2.5	3.14156	700	13744.325	509.0	1.21	616	20	30.8	2.2
Tujunga Wash	2.5	3.14156	500	9817.375	363.6	1.21	440	20	22.0	2.2
Kester	1.75	3.14156	500	4810.51375	178.2	1.21	216	20	10.8	1.1