

## ***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
<b>Force Main</b>			
<b>Excavation and Shoring</b>			
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 <sup>1</sup>		
Haul Trips – staging areas	11		
Supply Trips - materials <sup>2</sup>	10		
Concrete or Gravel Truck	4 <sup>3</sup>		
<b>Bedding</b>			
Loader	2	0.40	150 hp
Workers	6		
Generator- Vent. Fans	1	0.80	50 hp
Supply Trips (materials)	6 <sup>4</sup>		
<b>Pipe Laying</b>			
Service Crane	1	0.50	250 hp
Loader	1	0.30	150 hp
Generator w/PwrTools	1	0.80	50 hp

<sup>1</sup> Peak

<sup>2</sup> 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**

<sup>3</sup>Concrete/Gravel to Lock Beams; Beam Span = 5', Peak = 44 piles, Avg = 22 piles, D=1.5' Depth=20', Drill hole volume =  $(\pi(R^2) \cdot 20) / 27 = (3.14156 \cdot .75 \cdot .75 \cdot 20) / 27 = 1.3$  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**

<sup>4</sup> Worst Case Force Main supply trips from EWVIS Excel Spreadsheet

# EWVIS – Draft EIR – EQUIPMENT AND CONSTRUCTION ASSUMPTIONS

January 10, 2019

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 <sup>5</sup>		
<b>Testing</b>			
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		
<b>Restoration</b>			
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 <sup>6</sup>		
Supply Trips (other)	6 <sup>7</sup>		
Supply Trips (asphalt)	3 <sup>8</sup>		
<b>Pump Stations (Each)</b>			
<b>Excavation and Shoring</b>			
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

<sup>5</sup> 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**

<sup>6</sup> Same info as Hauling to/from Staging Areas under Excavation/Shoring

<sup>7</sup> Other trips associated with special circumstances, such as concrete encasing of pipe segment in eastern portion of the alignment

<sup>8</sup> Worst Case Asphalt/Base Trips from EWVIS Excel Spreadsheet

# EWVIS – Draft EIR – EQUIPMENT AND CONSTRUCTION ASSUMPTIONS

January 10, 2019

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 <sup>9</sup>		
Supply Trips (materials) Pump Stations	8 <sup>10</sup>		
Gravel Trips Pump Stations	6 <sup>11</sup>		
<b>Formwork and Casting</b>			
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 <sup>12</sup>		
Concrete Trips Pump Stations	11 <sup>13</sup>		
<b>Equipment Installation</b>			
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		

<sup>9</sup> Worst Case Daily Haul Trips from EWWIS Excel Spreadsheet

<sup>10</sup> 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**

<sup>11</sup> 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**

<sup>12</sup> 1 trip each lumber for formwork, rebar, plumbing, electrical

<sup>13</sup> 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

# EWVIS – Draft EIR – EQUIPMENT AND CONSTRUCTION ASSUMPTIONS

January 10, 2019

Equipment	Number of Pieces	Percent Usage (each)	HP (each) or other info
Supply Trips Pump Station	4 <sup>14</sup>		
<b>Restoration</b>			
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 <sup>15</sup>		
Haul Trips (shoring) Pump Station	8 <sup>16</sup>		
Concrete Trips Pump Station	2 <sup>17</sup>		
<b>Diversion Structures (Each)</b>			
<b>Excavation and Shoring</b>			
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 <sup>18</sup>		

<sup>14</sup> 1 trip each for pumps, plumbing, electrical, misc

<sup>15</sup> Minor filling

<sup>16</sup> Shoring haul away – same as shoring supply trips

<sup>17</sup> Concrete and Misc

<sup>18</sup>Worst Case for Net Soil Export – Peak from EWVIS Excel Spreadsheet

# EWVIS – Draft EIR – EQUIPMENT AND CONSTRUCTION ASSUMPTIONS

January 10, 2019

Equipment	Number of Pieces	Percent Usage (each)	HP (each) or other info
Haul Trips -staging Diversion	7 <sup>19</sup>		
Supply Trips -materials Diversion	5 <sup>20</sup>		
Gravel Trips Diversion	2 <sup>21</sup>		
<b>Formwork and Casting</b>			
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 Diversion	3 <sup>22</sup>		
Concrete Trips Diversion	1		
<b>Equipment Installation</b>			
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 Diversion	3 <sup>23</sup>		
<b>Restoration</b>			
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

<sup>19</sup> Worst Case for Peak Daily Haul Trips to/from Staging Areas from EWVIS Excel Spreadsheet

<sup>20</sup> 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

<sup>21</sup> 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**

<sup>22</sup> 1 trip each lumber for formwork, rebar, electrical

<sup>23</sup> 1 trip each gate gear, misc

# EWVIS – Draft EIR – EQUIPMENT AND CONSTRUCTION ASSUMPTIONS

January 10, 2019

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) Diversion	7		
Haul Trips (shoring) Diversion	3		
Supply Trips (asphalt) Diversion	2 <sup>24</sup>		
<b>Junction to EVIS</b>			
<b>Excavation and Shoring</b>			
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 <sup>25</sup>		
Haul Trips - net export	4		
Supply Trips - materials	22 <sup>26</sup>		
Concrete or Gravel Trips	3 <sup>27</sup>		
<b>Formwork and Casting</b>			

<sup>24</sup> Vol asphalt/truck capacity:  $(L * W * D)/27/10$ cy truck,  $(16*16*1)/27/10$ , Asphalt Trips =.95, Misc Trips=1: Total Daily” 1.95 trips

<sup>25</sup> Total and Peak Daily Haul Trips to/from Staging Areas from EWVIS Excel Spreadsheet

<sup>26</sup> 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

<sup>27</sup> 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)



# EWVIS – Draft EIR – EQUIPMENT AND CONSTRUCTION ASSUMPTIONS

January 10, 2019

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 <sup>28</sup>		
Concrete Truck	16 <sup>29</sup>		
<b>Equipment Installation</b>			
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 <sup>30</sup>		
<b>Restoration</b>			
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 <sup>31</sup>		
Haul Trips (shoring)	22		
Supply Trips (base)	4		
Supply Trips (for concrete structure)	11		
Supply Trips (asphalt)	4 <sup>32</sup>		
<b>Connecting Sewers (Each)</b>			
<b>Excavation and Shoring</b>			
Concrete Saw	1	0.50	60 hp

<sup>28</sup>1 ea for lumber and rebar, Misc

<sup>29</sup> 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)

<sup>30</sup> Monitoring equipment or misc

<sup>31</sup> Total and Peak Daily Haul Trips to/from Staging Areas from EWVIS Excel Spreadsheet

<sup>32</sup> Vol asphalt/truck capacity: (L \* W \* D)/27/10cy truck, (30\*30\*1)/27/10 = 3.3

# EWVIS – Draft EIR – EQUIPMENT AND CONSTRUCTION ASSUMPTIONS

January 10, 2019

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 <sup>33</sup>		
Haul Truck –staging	15 <sup>34</sup> peak day		
Supply Truck (materials)	10 <sup>35</sup>		
Concrete or Gravel Truck			
<b>Bedding</b>			
Loader	1	0.50	150 hp
Generator- Vent. Fans	1	0.80	50 hp
Workers	6		
Supply Trips	3 <sup>36</sup>		
<b>Pipe Laying</b>			
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		
<b>Restoration</b>			

<sup>33</sup> Daily Haul Trips for Net Soil Export from EWVIS Excel Spreadsheet

<sup>34</sup>Peak Daily Trips to/from Staging Areas from EWVIS Excel Spreadsheet

<sup>35</sup> 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**

<sup>36</sup> Concrete/Gravel to Lock Beams: Beam Span = 5', Peak = 44 piles, D=1.5' Depth=20', Drill hole volume =  $(\pi(R^2) \cdot 20) / 27 = (3.14156 \cdot .75 \cdot .75 \cdot 20) / 27 = 1.3$  cy: **Peak Trips = (1.3\*44)/20 = 57.2/20 = 2.9 Trips**

## EWVIS – Draft EIR – EQUIPMENT AND CONSTRUCTION ASSUMPTIONS

January 10, 2019

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 <sup>37</sup> peak day		
Haul Truck (shoring)	9		
Supply Trips (asphalt)	2 <sup>38</sup>		
Concrete Trips	1		
<b>Microtunneling (Each)</b>			
<b>Excavation and Shoring</b>			
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 <sup>39</sup>		
Supply Trips - materials	17 <sup>40</sup>		

<sup>37</sup> Peak Daily Trips to/from Staging Areas from EWVIS Excel Spreadsheet

<sup>38</sup>Vol asphalt/truck capacity: (L \* W \* D)/27/10cy truck, (4\*100\*1)/27/10 =1.4

<sup>39</sup> Worst Case Daily Haul Trips from EWVIS Excel Spreadsheet

<sup>40</sup> 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**

## EWVIS – Draft EIR – EQUIPMENT AND CONSTRUCTION ASSUMPTIONS

January 10, 2019

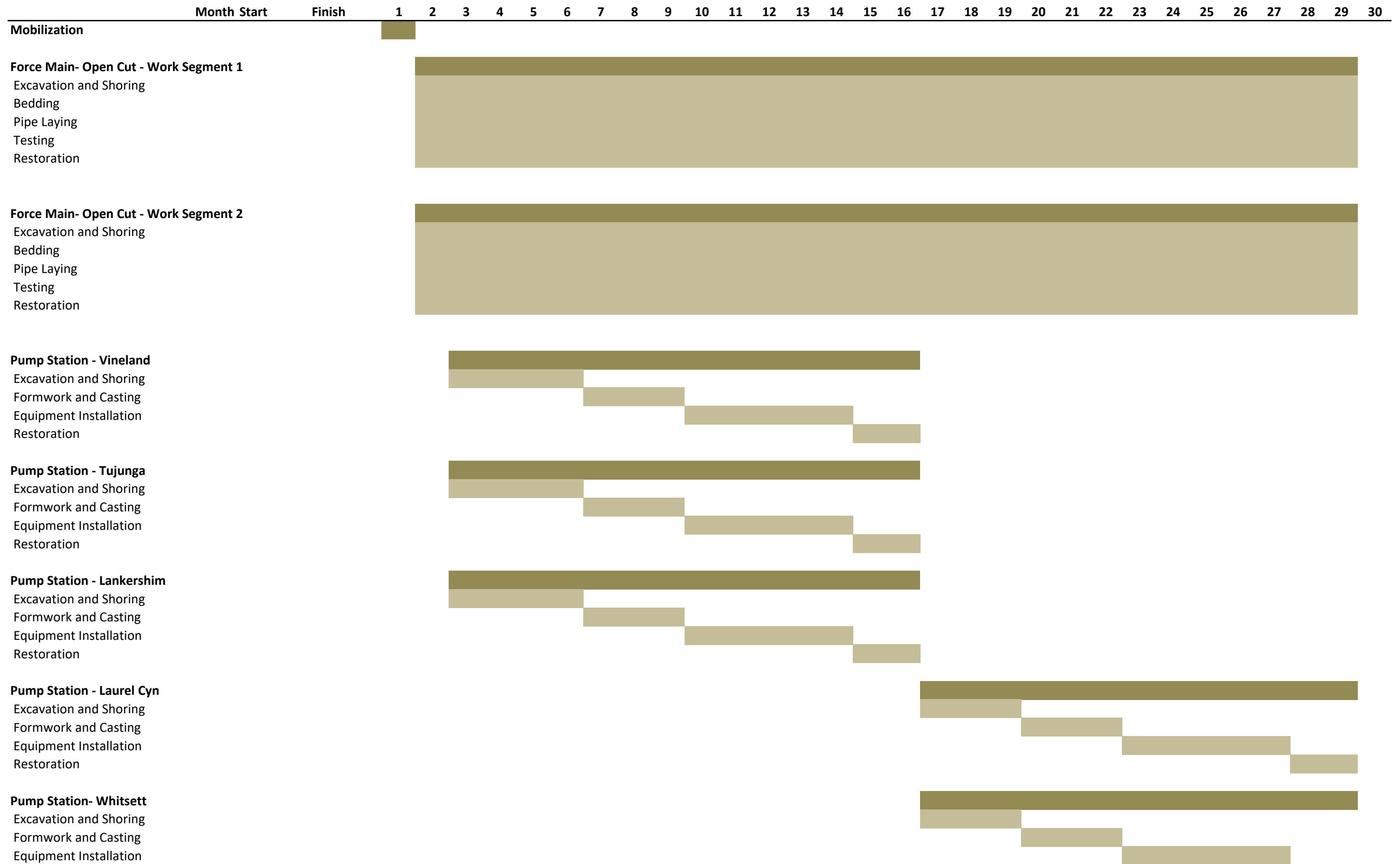
Equipment	Number of Pieces	Percent Usage (each)	HP (each) or other info
Concrete or Gravel Trips	3 <sup>41</sup>		
<b>Pipe Installation</b>			
Large Crane	1	0.40	350 hp
Loader	1	0.40	150 hp
Generator w/PwrTools	1	0.80	50 hp
Generator- Vent. Fans	1	0.80	50 hp
Compressor w/PwrTools	1	0.80	50 hp
Tunnel 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 <sup>42</sup>		
<b>Restoration</b>			
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 <sup>43</sup>		
Supply Trips (access structures)	6 <sup>44</sup>		
Haul Trips (staging)	34		

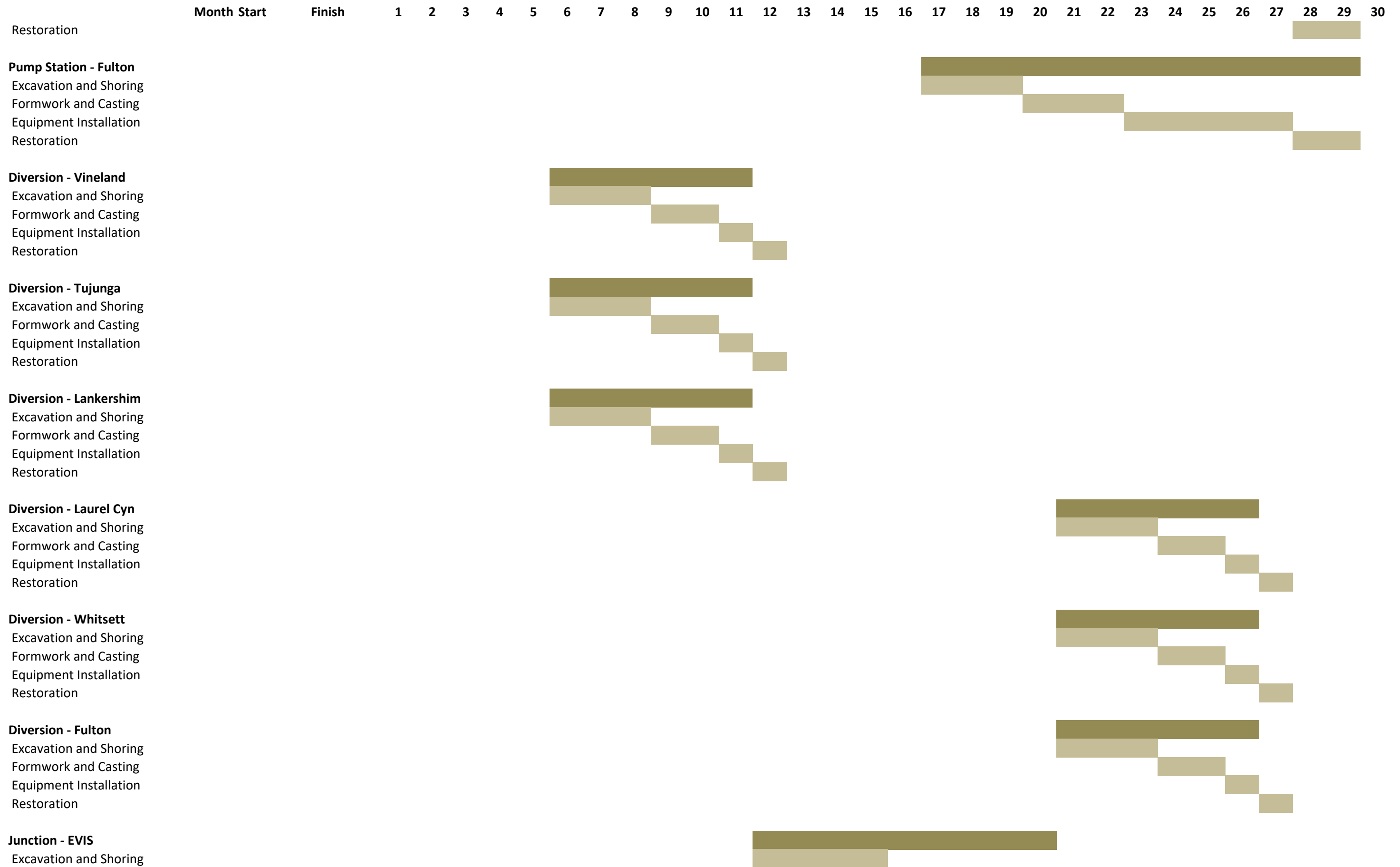
Concrete/Gravel to lock piles: 144 piles, D=2.5' Lock Depth=60', Drill hole volume =  $(\pi(R^2R)*60)/27 = (3.14156 * 1.25 * 1.25 * 60)/27 = 11$  cy: TOTAL Trips = 79.2 (=11\*144 /20), 5 piles per day: **Daily Trips = 2.75 trips** (55 cy/20)<sup>41</sup>

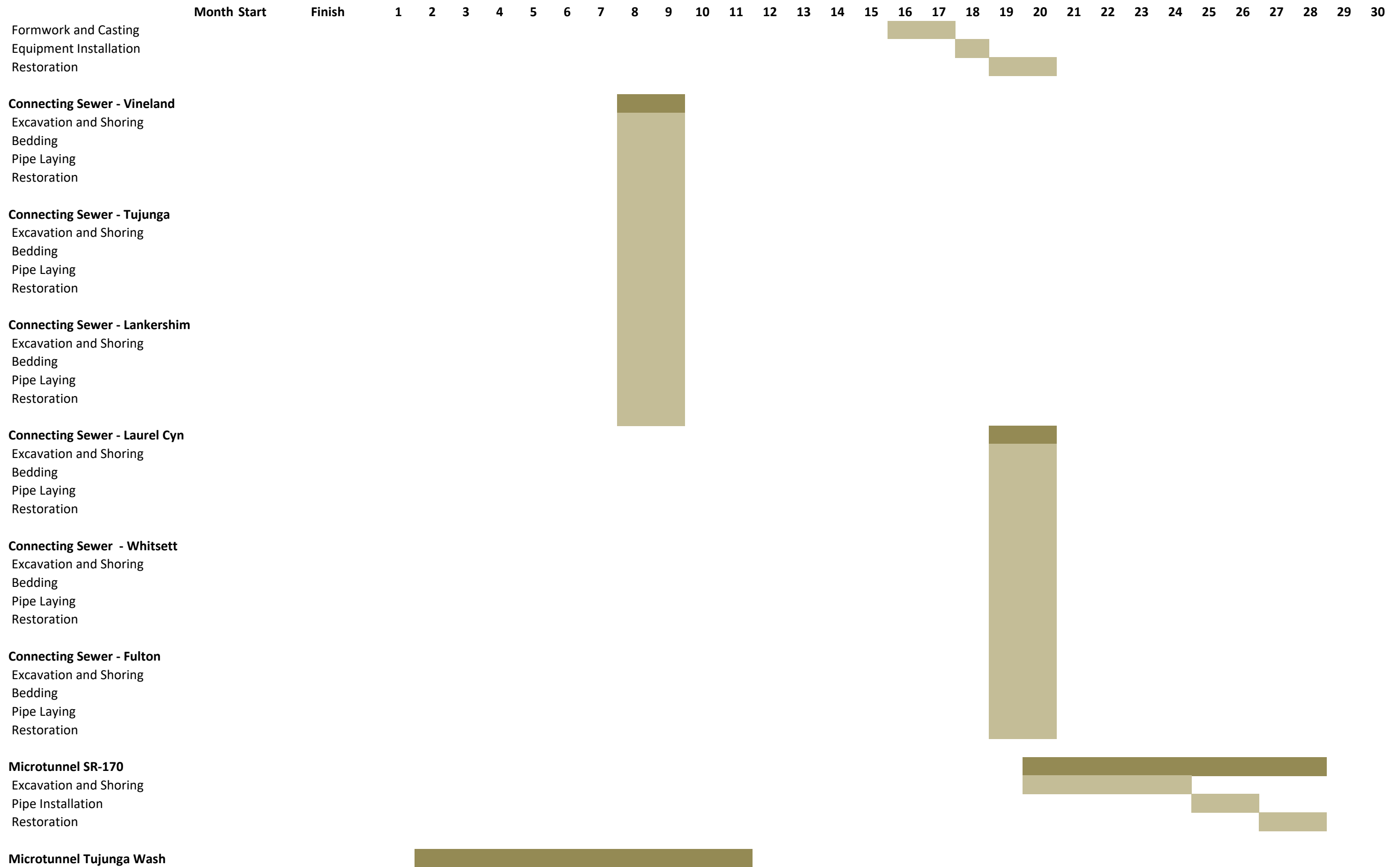
<sup>42</sup> RCP - 16 feet, weight assumption: Rinker, 42" = 745 lbs/ft = 11,920 per pipe, truck load weight: ~30,000 lbs, Pipes per Trip: 2, **Daily Trips = ~50'=3 pipes = 3/2 = 1.5 trips**, Slurry - Bentonite: Assume 1 truck trip per day during pipe installation. **Daily Trips: 2.5**

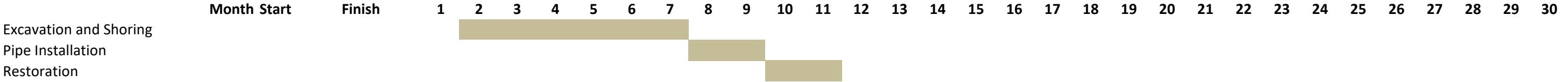
<sup>43</sup>Vol asphalt/truck capacity:  $(L * W * D)/27/10$ cy truck,  $(20*30*1)/27/10=2.2$

<sup>44</sup> Assumes pre-cast access structure segments









Microtunnel Kester Avenue Storm Drain



Microtunnel Sepulveda \*



Microtunnel I-405 \*



\* Optional

Top Task

More detailed associated with top task



Force Main		Pipe OD	Trench	Trench	Trench	Displaced	Displaced	Swell	Total	Haul Truck	Daily	Peak Daily Haul Trips	Avg Daily	Haul Trips	Pipe	Pipe	Base	Base	Base	Net Soil Export	Net Soil Export peak	NetExp Avg	Supply Trips	Asphalt/Base Trips
	Inches	Width	Avg. Depth	Length	Volume (cf)	Volume (cy)	Factor	Volume	Capacity	Haul trucks	to/from Staging Area	to/from Staging Area	Vol (cf)	Vol (cy)	Depth	Vol (cf)	Vol (cy)	Haul (CY)	Daily Haul Trips	Daily Haul Trips	Base	Base		
	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	Pit	Pit	Displaced	Displaced	Swell	Total	Haul Truck	Total	Peak Daily Haul Trips					Tot. Base	Tot. Base	Net Soil Export	Net Soil Exp peak					
		Width	Avg. Depth	Length	Volume (cf)	Volume (cy)	Factor	Volume	Capacity	Haul trucks	to/from Staging Area					Vol (cf)	Vol (cy)	Tot. Haul (CY)	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	Trench	Total Trench	Displaced	Displaced	Swell	Total	Haul Truck	Total	Peak Daily	Avg Daily	Tot. Pipe	Tot. Pipe	Base	Tot. Base	Tot. Base	Net Export	Net Soil Exp peak				
		Width	Avg. Depth	Length	Volume (cf)	Volume (cy)	Factor	Volume	Capacity	Haul trucks	Haul trucks	Haul trucks	Haul trucks	Vol (cf)	Vol (cy)	Depth	Vol (cf)	Vol (cy)	Tot. Haul (CY)	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	Pit	Pit	Displaced	Displaced	Swell	Total	Haul Truck	Total	Peak Daily Haul Trips			Typ. PS	Typ PS					Daily				
		Width	Avg. Depth	Length	Volume (cf)	Volume (cy)	Factor	Volume	Capacity	Haul trucks	to Inert LF or other End use			Conc. Vol (cy)	Trips					Haul trucks				
Vineland		35	31	15	16275	602.8	1.21	729	20	36.5	18.2					18.2			18.2					
Tujunga		26	30	12	9360	346.7	1.21	419	20	21.0	10.5					10.5			10.5					
Lankershim		29	33	13	12441	460.8	1.21	558	20	27.9	13.9					13.9			13.9					
Laurel		27	26	12	8424	312.0	1.21	378	20	18.9	9.4					9.4			9.4					
Whitsett		28	30	12	10080	373.3	1.21	452	20	22.6	11.3		110.0	11		11.3			11.3					
Fulton		28	30	12	10080	373.3	1.21	452	20	22.6	11.3					11.3			11.3					
Microtunnel Pit		Pit	Pit	Pit	Displaced	Displaced	Swell	Total	Haul Truck	Total	Daily													
		Width	Avg. Depth	Length	Volume (cf)	Volume (cy)	Factor	Volume	Capacity	Haul trucks	Haul trucks													
SR170		20	16	30	9600	355.6	1.21	430	20	21.5	10.8								10.8					
Tujunga Wash		20	50	30	30000	1111.1	1.21	1344	20	67.2	33.6								33.6					
Kester		20	26	30	15600	577.8	1.21	699	20	35.0	17.5								17.5					
Tunnel Spoils		Pipe	Pit	Pipe Install	Displaced	Displaced	Swell	Total	Haul Truck	Total	Daily													
		Radius		Length	Volume (cf)	Volume (cy)	Factor	Volume	Capacity	Haul trucks	Haul trucks													
SR170		2.5	3.14156	700	13744.325	509.0	1.21	616	20	30.8	2.2								2.2					
Tujunga Wash		2.5	3.14156	500	9817.375	363.6	1.21	440	20	22.0	2.2								2.2					
Kester		1.75	3.14156	500	4810.51375	178.2	1.21	216	20	10.8	1.1								1.1					

