

APPENDIX A-1

**A-1: AIR QUALITY MODELING REPORT
(ILLINGWORTH & RODKIN, 2016)**

Chelsea Wetlands – Construction Schedule and Equipment

Project Name:		Chelsea Wetlands					
Qty	Description	HP	Load Factor	Hours/day	Total Work Days	Annual Hours	Comments
Demolition / Clearing		Start Date:	6/30/2016		9		
		End Date:	7/10/2016				
1	Excavators	162	0.38	8	5	40	Demolition Volume
1	Rubber-Tired Dozers	255	0.4	8	5	40	Square footage of conc. foundation to be demolished 2,250 square feet and Remove 30 Trees
Site Preparation / Stripping		Start Date:	6/30/2016		9		
		End Date:	7/8/2016				
2	Scraper	361	0.4824	8	6	96	
1	Tractors/Loaders/Backhoes	97	0.37	8	6	48	
Grading / Excavation		Start Date:	7/8/2016		124		
		End Date:	12/30/2016				
2	Excavators	162	0.38	6	95	1140	Soil Hauling Volume Export volume = 38,000 cubic yards Import volume = 0 cubic yards
1	Graders	174	0.41	8	95	760	
1	Rubber Tired Dozers	255	0.4	8	95	760	
1	Tractors/Loaders/Backhoes	97	0.37	8	95	760	
2	Scraper	361	0.48	8	95	1520	
Force Main Construction		Start Date:	9/1/2016		8		
		End Date:	9/12/2016				
1	Tractor/Loader/Backhoe/Compactor	97	0.3685	8	7	56	
1	Excavator	162	0.3819	8	7	56	
1	Trench Compactor	97	0.3685	8	7	56	
Con-Span Culvert		Start Date:	10/6/2016		15		
		End Date:	10/26/2016				
1	Cranes	226	0.2881	4	15	60	
1	Excavator	162	0.3819	8	15	120	
1	Compactor	84	0.4958	6	15	90	
1	Tractors/Loaders/Backhoes	97	0.3685	4	15	60	
Sheet Piles		Start Date:	10/6/2016		20		
		End Date:	11/2/2016				
1	Pile Driver	226	0.2881	8	20	160	
1	Tractors/Loaders/Backhoes	97	0.37	4	20	80	
Equipment types listed in "Equipment Types" worksheet tab.							
Equipment listed in this sheet is to provide an example of inputs							
It is assumed that water trucks would be used during grading							
Add or subtract phases and equipment, as appropriate							
Modify horsepower or load factor, as appropriate							

Chelsea Wetlands - Hercules, CA
Contra Costa County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Recreational	1.00	User Defined Unit	12.30	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	58
Climate Zone	5			Operational Year	2014
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MW hr)	641.35	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Project acreage - 12.3 Geoff Reilly phone conversation 1/31/2014.

Construction Phase - Anticipated construction schedule provided by project applicant.

Off-road Equipment - Anticipated construction equipment list provided by project applicant.

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Trips and VMT -

Demolition - 2,250 s.f. demolition.

Grading - 38,000cy soil export

Construction Off-road Equipment Mitigation - Tier 3 mitigation scenario. BAAQMD BMP fugitive dust control.

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	20.00	9.00

tblConstructionPhase	NumDays	30.00	124.00
tblConstructionPhase	NumDays	10.00	9.00
tblConstructionPhase	PhaseEndDate	1/2/2017	12/30/2016
tblConstructionPhase	PhaseEndDate	7/25/2016	7/12/2016
tblConstructionPhase	PhaseEndDate	1/11/2017	9/12/2016
tblConstructionPhase	PhaseEndDate	10/10/2016	11/2/2016
tblConstructionPhase	PhaseEndDate	11/23/2016	10/26/2016
tblConstructionPhase	PhaseStartDate	7/13/2016	7/12/2016
tblConstructionPhase	PhaseStartDate	7/13/2016	6/30/2016
tblConstructionPhase	PhaseStartDate	12/31/2016	9/1/2016
tblConstructionPhase	PhaseStartDate	9/13/2016	10/6/2016
tblConstructionPhase	PhaseStartDate	11/3/2016	10/6/2016
tblGrading	MaterialExported	0.00	38,000.00
tblLandUse	LotAcreage	0.00	12.30
tblOffRoadEquipment	HorsePower	171.00	226.00
tblOffRoadEquipment	HorsePower	8.00	97.00
tblOffRoadEquipment	HorsePower	8.00	84.00
tblOffRoadEquipment	LoadFactor	0.42	0.29
tblOffRoadEquipment	LoadFactor	0.43	0.37
tblOffRoadEquipment	LoadFactor	0.43	0.50
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	UsageHours	8.00	4.50
tblOffRoadEquipment	UsageHours	8.00	4.60
tblOffRoadEquipment	UsageHours	8.00	6.20
tblOffRoadEquipment	UsageHours	8.00	4.50
tblOffRoadEquipment	UsageHours	8.00	6.20
tblOffRoadEquipment	UsageHours	8.00	6.20
tblOffRoadEquipment	UsageHours	8.00	6.20
tblOffRoadEquipment	UsageHours	8.00	6.20
tblOffRoadEquipment	UsageHours	8.00	5.40

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2016	0.3701	4.3332	3.0147	4.8700e-003	0.4788	0.1783	0.6571	0.1883	0.1640	0.3523	0.0000	451.1267	451.1267	0.0854	0.0000	452.9197
Total	0.3701	4.3332	3.0147	4.8700e-003	0.4788	0.1783	0.6571	0.1883	0.1640	0.3523	0.0000	451.1267	451.1267	0.0854	0.0000	452.9197

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2016	0.1321	2.1304	2.4392	4.8700e-003	0.2442	0.0700	0.3143	0.0534	0.0693	0.1227	0.0000	451.1264	451.1264	0.0854	0.0000	452.9194
Total	0.1321	2.1304	2.4392	4.8700e-003	0.2442	0.0700	0.3143	0.0534	0.0693	0.1227	0.0000	451.1264	451.1264	0.0854	0.0000	452.9194

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	64.30	50.84	19.09	0.00	48.99	60.74	52.18	71.63	57.78	65.18	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	6/30/2016	7/12/2016	5	9	
2	Site Preparation	Site Preparation	6/30/2016	7/12/2016	5	9	
3	Grading	Grading	7/12/2016	12/30/2016	5	124	
4	Force Main	Trenching	9/1/2016	9/12/2016	5	8	
5	Sheet Piles	Trenching	10/6/2016	11/2/2016	5	20	
6	Con-Span Culvert	Trenching	10/6/2016	10/26/2016	5	15	

Acres of Grading (Site Preparation Phase): 12.15

Acres of Grading (Grading Phase): 240.25

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	0	8.00	81	0.73
Demolition	Excavators	1	4.50	162	0.38
Demolition	Rubber Tired Dozers	1	4.50	255	0.40
Site Preparation	Rubber Tired Dozers	0	8.00	255	0.40
Site Preparation	Scrapers	2	5.40	361	0.48
Site Preparation	Tractors/Loaders/Backhoes	1	5.40	97	0.37
Grading	Excavators	2	4.60	162	0.38
Grading	Graders	1	6.20	174	0.41
Grading	Rubber Tired Dozers	1	6.20	255	0.40
Grading	Scrapers	2	6.20	361	0.48
Grading	Tractors/Loaders/Backhoes	1	6.20	97	0.37
Force Main	Excavators	1	7.00	162	0.38
Force Main	Plate Compactors	1	7.00	97	0.37
Force Main	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Sheet Piles	Other Construction Equipment	1	8.00	226	0.29
Sheet Piles	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Con-Span Culvert	Cranes	1	4.00	226	0.29
Con-Span Culvert	Excavators	1	8.00	162	0.38
Con-Span Culvert	Plate Compactors	1	6.00	84	0.50

Con-Span Culvert	Tractors/Loaders/Backhoes	1	4.00	97	0.37
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Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	2	5.00	0.00	10.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	7	18.00	0.00	4,750.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Force Main	3	8.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Sheet Piles	2	5.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Con-Span Culvert	4	10.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

- Use Cleaner Engines for Construction Equipment
- Use Soil Stabilizer
- Replace Ground Cover
- Water Exposed Area
- Reduce Vehicle Speed on Unpaved Roads
- Clean Paved Roads

3.2 Demolition - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.1100e-003	0.0000	1.1100e-003	1.7000e-004	0.0000	1.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.1200e-003	0.0463	0.0352	4.0000e-005		2.1900e-003	2.1900e-003		2.0100e-003	2.0100e-003	0.0000	3.3833	3.3833	1.0200e-003	0.0000	3.4047
Total	4.1200e-003	0.0463	0.0352	4.0000e-005	1.1100e-003	2.1900e-003	3.3000e-003	1.7000e-004	2.0100e-003	2.1800e-003	0.0000	3.3833	3.3833	1.0200e-003	0.0000	3.4047

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.2000e-004	1.5000e-003	1.2500e-003	0.0000	8.0000e-005	2.0000e-005	1.0000e-004	2.0000e-005	2.0000e-005	4.0000e-005	0.0000	0.3428	0.3428	0.0000	0.0000	0.3428
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.0000e-005	1.2000e-004	1.2200e-003	0.0000	2.0000e-004	0.0000	2.1000e-004	5.0000e-005	0.0000	6.0000e-005	0.0000	0.1850	0.1850	1.0000e-005	0.0000	0.1852
Total	2.0000e-004	1.6200e-003	2.4700e-003	0.0000	2.8000e-004	2.0000e-005	3.1000e-004	7.0000e-005	2.0000e-005	1.0000e-004	0.0000	0.5278	0.5278	1.0000e-005	0.0000	0.5280

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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Category	tons/yr										MT/yr					
	Fugitive Dust					5.0000e-004	0.0000	5.0000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.8000e-004	0.0169	0.0220	4.0000e-005		7.1000e-004	7.1000e-004		7.1000e-004	7.1000e-004	0.0000	3.3833	3.3833	1.0200e-003	0.0000	3.4047
Total	8.8000e-004	0.0169	0.0220	4.0000e-005	5.0000e-004	7.1000e-004	1.2100e-003	4.0000e-005	7.1000e-004	7.5000e-004	0.0000	3.3833	3.3833	1.0200e-003	0.0000	3.4047

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Hauling	1.2000e-004	1.5000e-003	1.2500e-003	0.0000	8.0000e-005	2.0000e-003	1.0000e-004	2.0000e-005	2.0000e-005	4.0000e-005	0.0000	0.3428	0.3428	0.0000	0.0000	0.3428
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.0000e-005	1.2000e-004	1.2200e-003	0.0000	2.0000e-004	0.0000	2.1000e-004	5.0000e-005	0.0000	6.0000e-005	0.0000	0.1850	0.1850	1.0000e-005	0.0000	0.1852
Total	2.0000e-004	1.6200e-003	2.4700e-003	0.0000	2.8000e-004	2.0000e-003	3.1000e-004	7.0000e-005	2.0000e-005	1.0000e-004	0.0000	0.5278	0.5278	1.0000e-005	0.0000	0.5280

3.3 Site Preparation - 2016

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Fugitive Dust					6.4400e-003	0.0000	6.4400e-003	7.0000e-004	0.0000	7.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.4300e-003	0.1168	0.0743	1.0000e-004		5.0700e-003	5.0700e-003		4.6600e-003	4.6600e-003	0.0000	9.4203	9.4203	2.8400e-003	0.0000	9.4800
Total	9.4300e-003	0.1168	0.0743	1.0000e-004	6.4400e-003	5.0700e-003	0.0115	7.0000e-004	4.6600e-003	5.3600e-003	0.0000	9.4203	9.4203	2.8400e-003	0.0000	9.4800

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	2.0000e-004	1.9500e-003	0.0000	3.3000e-004	0.0000	3.3000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.2960	0.2960	2.0000e-005	0.0000	0.2963
Total	1.4000e-004	2.0000e-004	1.9500e-003	0.0000	3.3000e-004	0.0000	3.3000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.2960	0.2960	2.0000e-005	0.0000	0.2963

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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Category	tons/yr										MT/yr					
Fugitive Dust					2.9000e-003	0.0000	2.9000e-003	1.6000e-004	0.0000	1.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.4600e-003	0.0483	0.0554	1.0000e-004		2.0000e-003	2.0000e-003		2.0000e-003	2.0000e-003	0.0000	9.4203	9.4203	2.8400e-003	0.0000	9.4799
Total	2.4600e-003	0.0483	0.0554	1.0000e-004	2.9000e-003	2.0000e-003	4.9000e-003	1.6000e-004	2.0000e-003	2.1600e-003	0.0000	9.4203	9.4203	2.8400e-003	0.0000	9.4799

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	2.0000e-004	1.9500e-003	0.0000	3.3000e-004	0.0000	3.3000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.2960	0.2960	2.0000e-005	0.0000	0.2963
Total	1.4000e-004	2.0000e-004	1.9500e-003	0.0000	3.3000e-004	0.0000	3.3000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.2960	0.2960	2.0000e-005	0.0000	0.2963

3.4 Grading - 2016

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Fugitive Dust					0.4189	0.0000	0.4189	0.1731	0.0000	0.1731	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2854	3.3285	2.1601	2.6800e-003		0.1548	0.1548		0.1424	0.1424	0.0000	253.1491	253.1491	0.0764	0.0000	254.7527
Total	0.2854	3.3285	2.1601	2.6800e-003	0.4189	0.1548	0.5737	0.1731	0.1424	0.3155	0.0000	253.1491	253.1491	0.0764	0.0000	254.7527

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Hauling	0.0550	0.7121	0.5934	1.7800e-003	0.0401	9.2400e-003	0.0494	0.0110	8.5000e-003	0.0195	0.0000	162.8046	162.8046	1.2100e-003	0.0000	162.8300
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.2000e-003	6.1800e-003	0.0603	1.2000e-004	0.0102	8.0000e-005	0.0102	2.7000e-003	8.0000e-005	2.7800e-003	0.0000	9.1758	9.1758	5.1000e-004	0.0000	9.1865
Total	0.0592	0.7183	0.6537	1.9000e-003	0.0503	9.3200e-003	0.0596	0.0137	8.5800e-003	0.0223	0.0000	171.9804	171.9804	1.7200e-003	0.0000	172.0165

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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Category	tons/yr										MT/yr					
Fugitive Dust					0.1885	0.0000	0.1885	0.0390	0.0000	0.0390	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0658	1.2851	1.6110	2.6800e-003		0.0547	0.0547		0.0547	0.0547	0.0000	253.1488	253.1488	0.0764	0.0000	254.7524
Total	0.0658	1.2851	1.6110	2.6800e-003	0.1885	0.0547	0.2432	0.0390	0.0547	0.0937	0.0000	253.1488	253.1488	0.0764	0.0000	254.7524

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Hauling	0.0550	0.7121	0.5934	1.7800e-003	0.0401	9.2400e-003	0.0494	0.0110	8.5000e-003	0.0195	0.0000	162.8046	162.8046	1.2100e-003	0.0000	162.8300
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.2000e-003	6.1800e-003	0.0603	1.2000e-004	0.0102	8.0000e-005	0.0102	2.7000e-003	8.0000e-005	2.7800e-003	0.0000	9.1758	9.1758	5.1000e-004	0.0000	9.1865
Total	0.0592	0.7183	0.6537	1.9000e-003	0.0503	9.3200e-003	0.0596	0.0137	8.5800e-003	0.0223	0.0000	171.9804	171.9804	1.7200e-003	0.0000	172.0165

3.5 Force Main - 2016

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Off-Road	2.5500e-003	0.0269	0.0204	3.0000e-005		1.6400e-003	1.6400e-003		1.5100e-003	1.5100e-003	0.0000	2.7738	2.7738	8.4000e-004	0.0000	2.7914
Total	2.5500e-003	0.0269	0.0204	3.0000e-005		1.6400e-003	1.6400e-003		1.5100e-003	1.5100e-003	0.0000	2.7738	2.7738	8.4000e-004	0.0000	2.7914

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2000e-004	1.8000e-004	1.7300e-003	0.0000	2.9000e-004	0.0000	2.9000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2631	0.2631	1.0000e-005	0.0000	0.2634
Total	1.2000e-004	1.8000e-004	1.7300e-003	0.0000	2.9000e-004	0.0000	2.9000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2631	0.2631	1.0000e-005	0.0000	0.2634

Mitigated Construction On-Site

ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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Category	tons/yr								MT/yr							
	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Off-Road	7.2000e-004	0.0149	0.0223	3.0000e-005		8.5000e-004	8.5000e-004		8.5000e-004	8.5000e-004	0.0000	2.7738	2.7738	8.4000e-004	0.0000	2.7914
Total	7.2000e-004	0.0149	0.0223	3.0000e-005		8.5000e-004	8.5000e-004		8.5000e-004	8.5000e-004	0.0000	2.7738	2.7738	8.4000e-004	0.0000	2.7914

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2000e-004	1.8000e-004	1.7300e-003	0.0000	2.9000e-004	0.0000	2.9000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2631	0.2631	1.0000e-005	0.0000	0.2634
Total	1.2000e-004	1.8000e-004	1.7300e-003	0.0000	2.9000e-004	0.0000	2.9000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2631	0.2631	1.0000e-005	0.0000	0.2634

3.6 Sheet Piles - 2016

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Off-Road	1.7000e-003	0.0163	0.0121	2.0000e-005		1.2500e-003	1.2500e-003		1.1500e-003	1.1500e-003	0.0000	1.4682	1.4682	4.4000e-004	0.0000	1.4775
Total	1.7000e-003	0.0163	0.0121	2.0000e-005		1.2500e-003	1.2500e-003		1.1500e-003	1.1500e-003	0.0000	1.4682	1.4682	4.4000e-004	0.0000	1.4775

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9000e-004	2.8000e-004	2.7000e-003	1.0000e-005	4.6000e-004	0.0000	4.6000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.4111	0.4111	2.0000e-005	0.0000	0.4116
Total	1.9000e-004	2.8000e-004	2.7000e-003	1.0000e-005	4.6000e-004	0.0000	4.6000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.4111	0.4111	2.0000e-005	0.0000	0.4116

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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Category	tons/yr										MT/yr					
	Off-Road	3.8000e-004	8.6700e-003	0.0117	2.0000e-005		6.1000e-004	6.1000e-004		6.1000e-004	6.1000e-004	0.0000	1.4682	1.4682	4.4000e-004	0.0000
Total	3.8000e-004	8.6700e-003	0.0117	2.0000e-005		6.1000e-004	6.1000e-004		6.1000e-004	6.1000e-004	0.0000	1.4682	1.4682	4.4000e-004	0.0000	1.4775

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9000e-004	2.8000e-004	2.7000e-003	1.0000e-005	4.6000e-004	0.0000	4.6000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.4111	0.4111	2.0000e-005	0.0000	0.4116
Total	1.9000e-004	2.8000e-004	2.7000e-003	1.0000e-005	4.6000e-004	0.0000	4.6000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.4111	0.4111	2.0000e-005	0.0000	0.4116

3.7 Con-Span Culvert - 2016

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Off-Road	6.8900e-003	0.0774	0.0460	7.0000e-005		4.0300e-003	4.0300e-003		3.7000e-003	3.7000e-003	0.0000	6.8371	6.8371	2.0600e-003	0.0000	6.8804
Total	6.8900e-003	0.0774	0.0460	7.0000e-005		4.0300e-003	4.0300e-003		3.7000e-003	3.7000e-003	0.0000	6.8371	6.8371	2.0600e-003	0.0000	6.8804

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8000e-004	4.2000e-004	4.0500e-003	1.0000e-005	6.8000e-004	1.0000e-005	6.9000e-004	1.8000e-004	1.0000e-005	1.9000e-004	0.0000	0.6167	0.6167	3.0000e-005	0.0000	0.6174
Total	2.8000e-004	4.2000e-004	4.0500e-003	1.0000e-005	6.8000e-004	1.0000e-005	6.9000e-004	1.8000e-004	1.0000e-005	1.9000e-004	0.0000	0.6167	0.6167	3.0000e-005	0.0000	0.6174

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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Category	tons/yr									MT/yr						
	Off-Road	1.7800e-003	0.0355	0.0502	7.0000e-005		1.7500e-003	1.7500e-003		1.7500e-003	1.7500e-003	0.0000	6.8370	6.8370	2.0600e-003	0.0000
Total	1.7800e-003	0.0355	0.0502	7.0000e-005		1.7500e-003	1.7500e-003		1.7500e-003	1.7500e-003	0.0000	6.8370	6.8370	2.0600e-003	0.0000	6.8804

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8000e-004	4.2000e-004	4.0500e-003	1.0000e-005	6.8000e-004	1.0000e-005	6.9000e-004	1.8000e-004	1.0000e-005	1.9000e-004	0.0000	0.6167	0.6167	3.0000e-005	0.0000	0.6174
Total	2.8000e-004	4.2000e-004	4.0500e-003	1.0000e-005	6.8000e-004	1.0000e-005	6.9000e-004	1.8000e-004	1.0000e-005	1.9000e-004	0.0000	0.6167	0.6167	3.0000e-005	0.0000	0.6174

Chelsea Wetlands - Hercules, CA
Contra Costa County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Recreational	1.00	User Defined Unit	12.30	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	58
Climate Zone	5			Operational Year	2014
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MW hr)	641.35	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Project acreage - 12.3 Geoff Reilly phone conversation 1/31/2014.

Construction Phase - Anticipated construction schedule provided by project applicant.

Off-road Equipment - Anticipated construction equipment list provided by project applicant.

Off-road Equipment - Anticipated construction equipment list provided by project applicant.

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Off-road Equipment - Anticipated construction equipment list provided by project applicant.

Off-road Equipment - Anticipated construction equipment list provided by project applicant.

Trips and VMT - On- and near-site travel.

Demolition - 2,250 s.f. demolition.

Grading - 38,000cy soil export

Construction Off-road Equipment Mitigation - Tier 3 mitigation scenario with Level 3 DPF. BAAQMD BMP fugitive dust control.

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	20.00	9.00
tblConstructionPhase	NumDays	30.00	124.00
tblConstructionPhase	NumDays	10.00	9.00
tblConstructionPhase	PhaseEndDate	1/2/2017	12/30/2016
tblConstructionPhase	PhaseEndDate	7/25/2016	7/12/2016
tblConstructionPhase	PhaseEndDate	1/11/2017	9/12/2016
tblConstructionPhase	PhaseEndDate	10/10/2016	11/2/2016
tblConstructionPhase	PhaseEndDate	11/23/2016	10/26/2016
tblConstructionPhase	PhaseStartDate	7/13/2016	7/12/2016
tblConstructionPhase	PhaseStartDate	7/13/2016	6/30/2016
tblConstructionPhase	PhaseStartDate	12/31/2016	9/1/2016
tblConstructionPhase	PhaseStartDate	9/13/2016	10/6/2016
tblConstructionPhase	PhaseStartDate	11/3/2016	10/6/2016
tblGrading	MaterialExported	0.00	38,000.00
tblLandUse	LotAcreage	0.00	12.30
tblOffRoadEquipment	HorsePower	171.00	226.00
tblOffRoadEquipment	HorsePower	8.00	97.00
tblOffRoadEquipment	HorsePower	8.00	84.00
tblOffRoadEquipment	LoadFactor	0.42	0.29
tblOffRoadEquipment	LoadFactor	0.43	0.37
tblOffRoadEquipment	LoadFactor	0.43	0.50
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	UsageHours	8.00	4.50
tblOffRoadEquipment	UsageHours	8.00	4.60
tblOffRoadEquipment	UsageHours	8.00	6.20
tblOffRoadEquipment	UsageHours	8.00	4.50
tblOffRoadEquipment	UsageHours	8.00	6.20
tblOffRoadEquipment	UsageHours	8.00	6.20
tblOffRoadEquipment	UsageHours	8.00	6.20
tblOffRoadEquipment	UsageHours	8.00	5.40
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50

tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	WorkerTripLength	12.40	0.50
tblTripsAndVMT	WorkerTripLength	12.40	0.50
tblTripsAndVMT	WorkerTripLength	12.40	0.50
tblTripsAndVMT	WorkerTripLength	12.40	0.50
tblTripsAndVMT	WorkerTripLength	12.40	0.50
tblTripsAndVMT	WorkerTripLength	12.40	0.50

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2016	0.3418	3.6851	2.7963	3.0400e-003	0.4280	0.1693	0.5973	0.1744	0.1558	0.3302	0.0000	285.5234	285.5234	0.0838	0.0000	287.2827
Total	0.3418	3.6851	2.7963	3.0400e-003	0.4280	0.1693	0.5973	0.1744	0.1558	0.3302	0.0000	285.5234	285.5234	0.0838	0.0000	287.2827

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2016	0.1037	1.4823	2.2208	3.0400e-003	0.1935	9.4800e-003	0.2029	0.0396	9.4500e-003	0.0490	0.0000	285.5231	285.5231	0.0838	0.0000	287.2824
Total	0.1037	1.4823	2.2208	3.0400e-003	0.1935	9.4800e-003	0.2029	0.0396	9.4500e-003	0.0490	0.0000	285.5231	285.5231	0.0838	0.0000	287.2824

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	69.64	59.78	20.58	0.00	54.80	94.40	66.03	77.31	93.93	85.15	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	6/30/2016	7/12/2016	5	9	
2	Site Preparation	Site Preparation	6/30/2016	7/12/2016	5	9	
3	Grading	Grading	7/12/2016	12/30/2016	5	124	
4	Force Main	Trenching	9/1/2016	9/12/2016	5	8	
5	Sheet Piles	Trenching	10/6/2016	11/2/2016	5	20	
6	Con-Span Culvert	Trenching	10/6/2016	10/26/2016	5	15	

Acres of Grading (Site Preparation Phase): 12.15

Acres of Grading (Grading Phase): 240.25

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	0	8.00	81	0.73
Demolition	Excavators	1	4.50	162	0.38
Demolition	Rubber Tired Dozers	1	4.50	255	0.40
Site Preparation	Rubber Tired Dozers	0	8.00	255	0.40
Site Preparation	Scrapers	2	5.40	361	0.48
Site Preparation	Tractors/Loaders/Backhoes	1	5.40	97	0.37
Grading	Excavators	2	4.60	162	0.38
Grading	Graders	1	6.20	174	0.41
Grading	Rubber Tired Dozers	1	6.20	255	0.40
Grading	Scrapers	2	6.20	361	0.48
Grading	Tractors/Loaders/Backhoes	1	6.20	97	0.37
Force Main	Excavators	1	7.00	162	0.38
Force Main	Plate Compactors	1	7.00	97	0.37
Force Main	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Sheet Piles	Other Construction Equipment	1	8.00	226	0.29
Sheet Piles	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Con-Span Culvert	Cranes	1	4.00	226	0.29
Con-Span Culvert	Excavators	1	8.00	162	0.38
Con-Span Culvert	Plate Compactors	1	6.00	84	0.50
Con-Span Culvert	Tractors/Loaders/Backhoes	1	4.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	2	5.00	0.00	10.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT
Grading	7	18.00	0.00	4,750.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT
Force Main	3	8.00	0.00	0.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT
Sheet Piles	2	5.00	0.00	0.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT
Con-Span Culvert	4	10.00	0.00	0.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

- Use Cleaner Engines for Construction Equipment
- Use DPF for Construction Equipment
- Use Soil Stabilizer
- Replace Ground Cover
- Water Exposed Area
- Reduce Vehicle Speed on Unpaved Roads
- Clean Paved Roads

3.2 Demolition - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.1100e-003	0.0000	1.1100e-003	1.7000e-004	0.0000	1.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.1200e-003	0.0463	0.0352	4.0000e-005		2.1900e-003	2.1900e-003		2.0100e-003	2.0100e-003	0.0000	3.3833	3.3833	1.0200e-003	0.0000	3.4047
Total	4.1200e-003	0.0463	0.0352	4.0000e-005	1.1100e-003	2.1900e-003	3.3000e-003	1.7000e-004	2.0100e-003	2.1800e-003	0.0000	3.3833	3.3833	1.0200e-003	0.0000	3.4047

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.0000e-005	1.5000e-004	9.1000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0164	0.0164	0.0000	0.0000	0.0164
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.0000e-005	2.0000e-005	2.3000e-004	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0119	0.0119	0.0000	0.0000	0.0120
Total	1.2000e-004	1.7000e-004	1.1400e-003	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0283	0.0283	0.0000	0.0000	0.0283

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.0000e-004	0.0000	5.0000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.8000e-004	0.0169	0.0220	4.0000e-005		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004	0.0000	3.3833	3.3833	1.0200e-003	0.0000	3.4047
Total	8.8000e-004	0.0169	0.0220	4.0000e-005	5.0000e-004	1.1000e-004	6.1000e-004	4.0000e-005	1.1000e-004	1.5000e-004	0.0000	3.3833	3.3833	1.0200e-003	0.0000	3.4047

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.0000e-005	1.5000e-004	9.1000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0164	0.0164	0.0000	0.0000	0.0164
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.0000e-005	2.0000e-005	2.3000e-004	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0119	0.0119	0.0000	0.0000	0.0120
Total	1.2000e-004	1.7000e-004	1.1400e-003	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0283	0.0283	0.0000	0.0000	0.0283

3.3 Site Preparation - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					6.4400e-003	0.0000	6.4400e-003	7.0000e-004	0.0000	7.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.4300e-003	0.1168	0.0743	1.0000e-004		5.0700e-003	5.0700e-003		4.6600e-003	4.6600e-003	0.0000	9.4203	9.4203	2.8400e-003	0.0000	9.4800
Total	9.4300e-003	0.1168	0.0743	1.0000e-004	6.4400e-003	5.0700e-003	0.0115	7.0000e-004	4.6600e-003	5.3600e-003	0.0000	9.4203	9.4203	2.8400e-003	0.0000	9.4800

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.0000e-005	3.0000e-005	3.7000e-004	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0191	0.0191	0.0000	0.0000	0.0192
Total	9.0000e-005	3.0000e-005	3.7000e-004	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0191	0.0191	0.0000	0.0000	0.0192

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.9000e-003	0.0000	2.9000e-003	1.6000e-004	0.0000	1.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.4600e-003	0.0483	0.0554	1.0000e-004		3.0000e-004	3.0000e-004		3.0000e-004	3.0000e-004	0.0000	9.4203	9.4203	2.8400e-003	0.0000	9.4799
Total	2.4600e-003	0.0483	0.0554	1.0000e-004	2.9000e-003	3.0000e-004	3.2000e-003	1.6000e-004	3.0000e-004	4.6000e-004	0.0000	9.4203	9.4203	2.8400e-003	0.0000	9.4799

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.0000e-005	3.0000e-005	3.7000e-004	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0191	0.0191	0.0000	0.0000	0.0192
Total	9.0000e-005	3.0000e-005	3.7000e-004	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0191	0.0191	0.0000	0.0000	0.0192

3.4 Grading - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4189	0.0000	0.4189	0.1731	0.0000	0.1731	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2854	3.3285	2.1601	2.6800e-003		0.1548	0.1548		0.1424	0.1424	0.0000	253.1491	253.1491	0.0764	0.0000	254.7527
Total	0.2854	3.3285	2.1601	2.6800e-003	0.4189	0.1548	0.5737	0.1731	0.1424	0.3155	0.0000	253.1491	253.1491	0.0764	0.0000	254.7527

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0283	0.0717	0.4336	9.0000e-005	1.0500e-003	3.7000e-004	1.4200e-003	2.9000e-004	3.4000e-004	6.3000e-004	0.0000	7.7685	7.7685	1.4000e-004	0.0000	7.7715
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8600e-003	8.6000e-004	0.0116	1.0000e-005	4.2000e-004	1.0000e-005	4.3000e-004	1.1000e-004	1.0000e-005	1.2000e-004	0.0000	0.5924	0.5924	6.0000e-005	0.0000	0.5936
Total	0.0311	0.0726	0.4451	1.0000e-004	1.4700e-003	3.8000e-004	1.8500e-003	4.0000e-004	3.5000e-004	7.5000e-004	0.0000	8.3610	8.3610	2.0000e-004	0.0000	8.3652

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1885	0.0000	0.1885	0.0390	0.0000	0.0390	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0658	1.2851	1.6110	2.6800e-003		8.2100e-003	8.2100e-003		8.2100e-003	8.2100e-003	0.0000	253.1488	253.1488	0.0764	0.0000	254.7524
Total	0.0658	1.2851	1.6110	2.6800e-003	0.1885	8.2100e-003	0.1967	0.0390	8.2100e-003	0.0472	0.0000	253.1488	253.1488	0.0764	0.0000	254.7524

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0283	0.0717	0.4336	9.0000e-005	1.0500e-003	3.7000e-004	1.4200e-003	2.9000e-004	3.4000e-004	6.3000e-004	0.0000	7.7685	7.7685	1.4000e-004	0.0000	7.7715
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8600e-003	8.6000e-004	0.0116	1.0000e-005	4.2000e-004	1.0000e-005	4.3000e-004	1.1000e-004	1.0000e-005	1.2000e-004	0.0000	0.5924	0.5924	6.0000e-005	0.0000	0.5936
Total	0.0311	0.0726	0.4451	1.0000e-004	1.4700e-003	3.8000e-004	1.8500e-003	4.0000e-004	3.5000e-004	7.5000e-004	0.0000	8.3610	8.3610	2.0000e-004	0.0000	8.3652

3.5 Force Main - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.5500e-003	0.0269	0.0204	3.0000e-005		1.6400e-003	1.6400e-003		1.5100e-003	1.5100e-003	0.0000	2.7738	2.7738	8.4000e-004	0.0000	2.7914
Total	2.5500e-003	0.0269	0.0204	3.0000e-005		1.6400e-003	1.6400e-003		1.5100e-003	1.5100e-003	0.0000	2.7738	2.7738	8.4000e-004	0.0000	2.7914

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.0000e-005	2.0000e-005	3.3000e-004	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0170	0.0170	0.0000	0.0000	0.0170
Total	8.0000e-005	2.0000e-005	3.3000e-004	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0170	0.0170	0.0000	0.0000	0.0170

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.2000e-004	0.0149	0.0223	3.0000e-005		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004	0.0000	2.7738	2.7738	8.4000e-004	0.0000	2.7914
Total	7.2000e-004	0.0149	0.0223	3.0000e-005		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004	0.0000	2.7738	2.7738	8.4000e-004	0.0000	2.7914

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.0000e-005	2.0000e-005	3.3000e-004	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0170	0.0170	0.0000	0.0000	0.0170
Total	8.0000e-005	2.0000e-005	3.3000e-004	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0170	0.0170	0.0000	0.0000	0.0170

3.6 Sheet Piles - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.7000e-003	0.0163	0.0121	2.0000e-005		1.2500e-003	1.2500e-003		1.1500e-003	1.1500e-003	0.0000	1.4682	1.4682	4.4000e-004	0.0000	1.4775
Total	1.7000e-003	0.0163	0.0121	2.0000e-005		1.2500e-003	1.2500e-003		1.1500e-003	1.1500e-003	0.0000	1.4682	1.4682	4.4000e-004	0.0000	1.4775

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3000e-004	4.0000e-005	5.2000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0265	0.0265	0.0000	0.0000	0.0266
Total	1.3000e-004	4.0000e-005	5.2000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0265	0.0265	0.0000	0.0000	0.0266

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.8000e-004	8.6700e-003	0.0117	2.0000e-005		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005	0.0000	1.4682	1.4682	4.4000e-004	0.0000	1.4775
Total	3.8000e-004	8.6700e-003	0.0117	2.0000e-005		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005	0.0000	1.4682	1.4682	4.4000e-004	0.0000	1.4775

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3000e-004	4.0000e-005	5.2000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0265	0.0265	0.0000	0.0000	0.0266
Total	1.3000e-004	4.0000e-005	5.2000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0265	0.0265	0.0000	0.0000	0.0266

3.7 Con-Span Culvert - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.8900e-003	0.0774	0.0460	7.0000e-005		4.0300e-003	4.0300e-003		3.7000e-003	3.7000e-003	0.0000	6.8371	6.8371	2.0600e-003	0.0000	6.8804
Total	6.8900e-003	0.0774	0.0460	7.0000e-005		4.0300e-003	4.0300e-003		3.7000e-003	3.7000e-003	0.0000	6.8371	6.8371	2.0600e-003	0.0000	6.8804

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9000e-004	6.0000e-005	7.8000e-004	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0398	0.0398	0.0000	0.0000	0.0399
Total	1.9000e-004	6.0000e-005	7.8000e-004	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0398	0.0398	0.0000	0.0000	0.0399

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.7800e-003	0.0355	0.0502	7.0000e-005		2.6000e-004	2.6000e-004		2.6000e-004	2.6000e-004	0.0000	6.8370	6.8370	2.0600e-003	0.0000	6.8804
Total	1.7800e-003	0.0355	0.0502	7.0000e-005		2.6000e-004	2.6000e-004		2.6000e-004	2.6000e-004	0.0000	6.8370	6.8370	2.0600e-003	0.0000	6.8804

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9000e-004	6.0000e-005	7.8000e-004	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0398	0.0398	0.0000	0.0000	0.0399
Total	1.9000e-004	6.0000e-005	7.8000e-004	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0398	0.0398	0.0000	0.0000	0.0399

Chelsea Wetlands, Hercules, CA - Construction Health impacts Summary

Maximum Impacts at Off-Site Residential Receptors

Construction Year	UNMITIGATED					
	Maximum Concentrations		Cancer Risk (per million)		Hazard Index (-)	Maximum Annual PM2.5 Concentration ($\mu\text{g}/\text{m}^3$)
	Exhaust PM2.5/DPM ($\mu\text{g}/\text{m}^3$)	Fugitive PM2.5 ($\mu\text{g}/\text{m}^3$)	Child	Adult		
			33.7	0.6		
2016	0.2050	0.4787	33.7	0.6	0.04	0.68

Chelsea Wetlands – Emissions for Construction Health Risk Modeling – Without Mitigation

Chelsea Wetlands, Hercules, CA - Without Mitigation DPM Construction Emissions and Modeling Emission Rates

Construction Year	Activity	DPM (ton/year)	Area Source	DPM Emissions			Modeled Area (m^2)	DPM Emission Rate ($\text{g}/\text{s}/\text{m}^2$)
				(lb/yr)	(lb/hr)	(g/s)		
2016	Demo, Site Prep & Grading	0.0758	CON1_DPM	151.5	0.04613	5.81E-03	22,160	2.62E-07
		0.0736	CON2_DPM	147.3	0.04484	5.65E-03	21,539	2.62E-07
	<i>Total</i>	0.1494		298.8	0.09097	0.01146	43,699	
2016	Force Main Construction	0.0015	FM_DPM	3.0	0.00092	1.16E-04	259	4.48E-07
2016	Flood Wall A	0.0012	FWA_DPM	2.3	0.00070	8.82E-05	674	1.31E-07
2016	Flood Wall B	0.0012	FWB_DPM	2.3	0.00070	8.82E-05	21,761	4.05E-09
2016	Con-Span Culvert	0.0037	CS_DPM	7.4	0.00225	2.84E-04	402	7.05E-07
<i>Total</i>		<i>0.1569</i>		<i>314</i>	<i>0.0955</i>	<i>0.0120</i>		

Notes:

Emissions assumed to be evenly distributed over each construction areas

hr/day = 9 (7am - 4pm)
 days/yr = 365
 hours/year = 3285

**Chelsea Wetlands, Hercules, CA - Without Mitigation
PM2.5 Fugitive Dust Construction Emissions for Modeling**

Construction Year	Activity	Area Source	PM2.5 Emissions				Modeled Area (m ²)	DPM Emission Rate g/s/m ²
			(ton/year)	(lb/yr)	(lb/hr)	(g/s)		
2016	Demo, Site Prep & Grading	CON1_PM	0.0884	176.8	0.05383	6.78E-03	22,160	3.06E-07
		CON2_PM	0.0859	171.9	0.05233	6.59E-03	21,539	3.06E-07
	<i>Total</i>		0.1744	348.7	0.10616	0.01338	43,699	
2016	Force Main Construction	FM_PM	0.00000	0.0	0.00000	0.00E+00	259	0.00E+00
2016	Flood Wall A	FWA_PM	0.00001	0.0	0.00001	7.67E-07	674	1.14E-09
2016	Flood Wall B	FWB_PM	0.00001	0.0	0.00001	7.67E-07	21,761	3.53E-11
2016	Con-Span Culvert	CS_PM	0.00001	0.0	0.00001	7.67E-07	402	1.91E-09
	<i>Total</i>		0.1744	348.8	0.1062	0.0134		

Notes:

Emissions assumed to be evenly distributed over each construction areas

hr/day = 9 (7am - 4pm)
days/yr = 365
hours/year = 3285

Chelsea Wetlands – Cancer Risk Calculations - – Without Mitigation

Chelsea Wetlands, Hercules, CA - Construction Impacts - Unmitigated Emissions Maximum DPM Cancer Risk Calculations From Construction Off-Site Residential Receptor Locations - 1.5 meters

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor (mg/kg-day)⁻¹
 ASF = Age sensitivity factor for specified age group
 ED = Exposure duration (years)
 AT = Averaging time for lifetime cancer risk (years)
 FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10⁻⁶

Where: C_{air} = concentration in air (µg/m³)
 DBR = daily breathing rate (L/kg body weight-day)
 A = Inhalation absorption factor
 EF = Exposure frequency (days/year)
 10⁻⁶ = Conversion factor

Values

Age --> Parameter	Infant/Child			Adult
	3rd Trimester	0 - 2	2 - 16	16 - 30
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Exposure Year	Exposure Duration (years)	Age	Infant/Child - Exposure Information		Infant/Child Cancer Risk (per million)	Adult - Exposure Information		Adult Cancer Risk (per million)	Fugitive PM2.5	Total PM2.5	
			DPM Conc (ug/m3)			Modeled DPM Conc (ug/m3)	Age Sensitivity Factor				
			Year	Annual							Year
0	0.25	-0.25 - 0*	-	-	10	-	-	-	-	-	
1	1	0 - 1	2016	0.2050	10	2016	0.2050	1	0.59	0.4787	
2	1	1 - 2		0.0000	10		0.0000	1	0.00		
3	1	2 - 3		0.0000	3		0.0000	1	0.00		
4	1	3 - 4		0.0000	3		0.0000	1	0.00		
5	1	4 - 5		0.0000	3		0.0000	1	0.00		
6	1	5 - 6		0.0000	3		0.0000	1	0.00		
7	1	6 - 7		0.0000	3		0.0000	1	0.00		
8	1	7 - 8		0.0000	3		0.0000	1	0.00		
9	1	8 - 9		0.0000	3		0.0000	1	0.00		
10	1	9 - 10		0.0000	3		0.0000	1	0.00		
11	1	10 - 11		0.0000	3		0.0000	1	0.00		
12	1	11 - 12		0.0000	3		0.0000	1	0.00		
13	1	12 - 13		0.0000	3		0.0000	1	0.00		
14	1	13 - 14		0.0000	3		0.0000	1	0.00		
15	1	14 - 15		0.0000	3		0.0000	1	0.00		
16	1	15 - 16		0.0000	3		0.0000	1	0.00		
17	1	16-17		0.0000	1		0.0000	1	0.00		
18	1	17-18		0.0000	1		0.0000	1	0.00		
19	1	18-19		0.0000	1		0.0000	1	0.00		
20	1	19-20		0.0000	1		0.0000	1	0.00		
21	1	20-21		0.0000	1		0.0000	1	0.00		
22	1	21-22		0.0000	1		0.0000	1	0.00		
23	1	22-23		0.0000	1		0.0000	1	0.00		
24	1	23-24		0.0000	1		0.0000	1	0.00		
25	1	24-25		0.0000	1		0.0000	1	0.00		
26	1	25-26		0.0000	1		0.0000	1	0.00		
27	1	26-27		0.0000	1		0.0000	1	0.00		
28	1	27-28		0.0000	1		0.0000	1	0.00		
29	1	28-29		0.0000	1		0.0000	1	0.00		
30	1	29-30		0.0000	1		0.0000	1	0.00		
Total Increased Cancer Risk						33.7				0.6	

* Third trimester of pregnancy