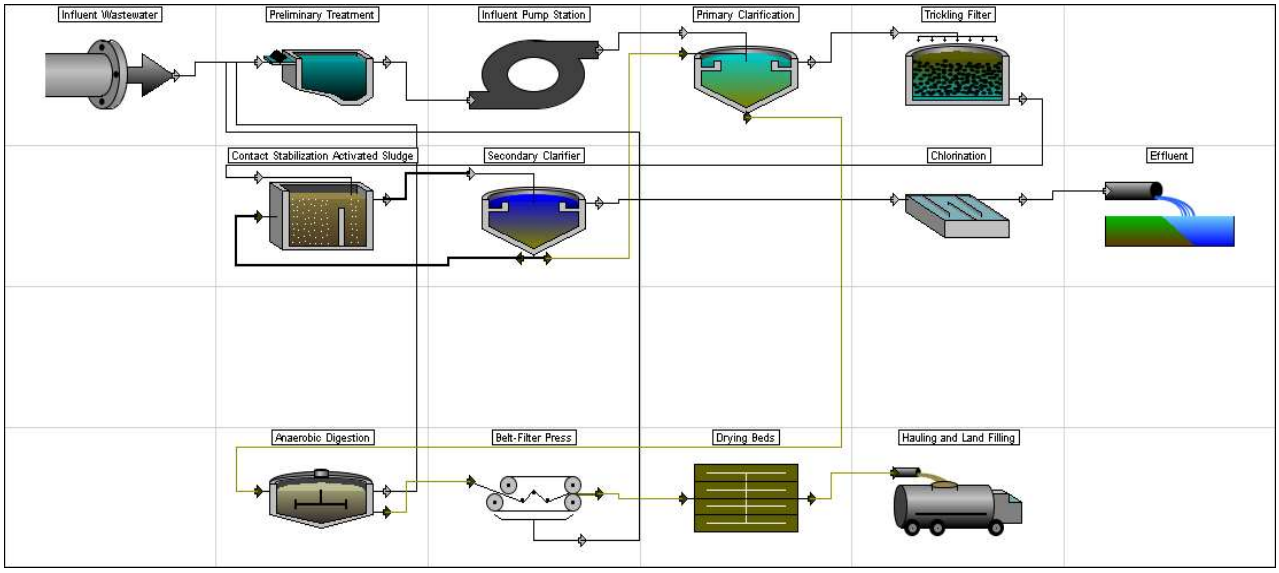
Layout - North Davis SD



Summary

Equipment Database

Hydromantis 2014,(USA Avg)

Layout Summary

Description	Value	Units
CONSTRUCTION COSTS		
Unit process construction cost	$90,100,000	$
Other direct construction costs	$23,200,000	$
Other indirect construction cos	$84,000,000	$
Total construction costs	$197,000,000	$
ANNUAL COSTS		
LABOR COSTS		
Administration labor cost	$290,000	$/yr
Laboratory labor cost	$264,000	$/yr
Unit process operation labor c	$2,930,000	$/yr
Unit process maintenance labc	$1,460,000	$/yr
Total labor costs	$4,950,000	$/yr
MATERIAL COSTS		
Total material cost	$934,000	$/yr
CHEMICAL COSTS		
Total chemical cost	$946,000	$/yr
ENERGY COSTS		
Total energy cost	$911,000	$/yr
Total operation and maintanen	$7,740,000	$/yr
CONSTRUCTION COST AMC		
Amortization cost for total cons	$17,000,000	$/yr
Total annual project cost	$24,700,000	$/yr
PROJECT SUMMARY		
Present worth	$296,000,000	$
Total project cost	$197,000,000	$
Total operation labor cost	$3,490,000	$/yr
Total maintenance labor cost	$1,460,000	$/yr
Total material cost	$934,000	$/yr
Total chemical cost	$946,000	$/yr
Total energy cost	$911,000	$/yr
Total amortization cost	$17,000,000	$/yr

Process Summary

Process	Construction ($)	Operation ($/yr)	Maintenance ($/yr)	Material ($/yr)	Chemical ($/yr)	Energy ($/yr)	Amortization ($/yr)
Preliminary Treatment	2450000	296000	118000	61300	0	8320	206000
Contact Stabilization Activated	10900000	190000	118000	149000	0	383000	990000
Anaerobic Digestion	20300000	302000	177000	211000	0	95500	1930000
Influent Pump Station	20500000	114000	83300	143000	0	91300	1740000

Secondary Clarifier	4390000	218000	119000	43700	0	5010	399000
Belt-Filter Press	2180000	76600	17900	0	254000	38900	203000
Primary Clarification	2810000	149000	81300	27900	0	2670	258000
Drying Beds	5340000	1220000	570000	48000	0	0	465000
Trickling Filter	16200000	176000	118000	93400	0	270000	1380000
Chlorination	3630000	145000	58700	84800	692000	16800	341000
Hauling and Land Filling	549000	42600	0	71800	0	0	93600
Effluent	0	0	0	0	0	0	0
Blower System	911000	0	0	0	0	0	76400
Other Costs	107000000	554000	0	0	0	0	8930000

Summary of Other Costs for Layout

Description	Value	Units
Other Costs		
Quantities		
Required land	38	acre
Administration labor hours	5640	hr/yr
Laboratory labor hours	5120	hr/yr
Costs		
DIRECT COSTS		
Mobilization	2140000	$
Site preparation	2440000	$
Site electrical	6480000	$
Yard piping	4160000	$
Instrumentation and control	3610000	$
Lab and administration building	4400000	$
Total direct construction costs	23200000	$
INDIRECT COSTS		
Cost of land	760000	$
Miscellaneous cost	6520000	$
Legal cost	2610000	$
Engineering design fee	19600000	$
Inspection cost	2610000	$
Contingency	13000000	$
Technical	2610000	$
Interest during construction	19300000	$
Profit	17000000	$
Total indirect construction cost	84000000	$
Total of other construction cos	107000000	$
LABOR COSTS		
Administration labor cost	290000	$/yr
Laboratory labor cost	264000	$/yr

Summary of Air Supply System

Description	Value	Units
Blower System for Entire Plant		
Design Information		
Minimum air flow capacity	10300	scfm
Safety factor	1.5	
Requested air flow capacity	15400	scfm
Total capacity of blowers	15400	scfm
Number of blowers in use	3	
Total number of blowers	4	
Capacity of individual blowers	5130	scfm
Estimated cost of an installed l	164000	$
Blower building area	1510	sqft
Costs		
Construction and equipment cc	911000	$
Installed Blower Cost	654000	$
Building Cost	166000	$
Misc Costs	90300	$
Operational labor cost	0	$/yr
Maintenance labor cost	0	$/yr
Material and supply cost	0	$/yr
Chemical cost	0	$/yr
Energy cost	0	$/yr
Amortization cost	76400	$/yr
Notes		
Energy costs are shown at the individual unit processes that require air		

Influent Wastewater
Preliminary Treatment
Design Output Data

Description	Value	Units
Preliminary Treatment		
Design Information		
Mechanically Cleaned Bar Screen		
Bar size	0.25	in
Bar spacing	0.5	in

Slope of bars from horizontal	30	degrees
Head loss through screen	0.176	ft
Approach velocity	2.5	ft/s
Average flow through velocity (	2.5	ft/s
Maximum flow through velocity	3	ft/s
Screen channel width	21.7	ft
Average channel depth	1	ft
Horizontal Flow Grit Chamber		
Maximum flow	123	cuft/s
Average flow	54.2	cuft/s
Minimum flow	35.7	cuft/s
Temperature	10	deg C
Maximum flow through velocity	1.5	ft/s
Average flow through velocity (	1	ft/s
Size of smallest particle 100%	0.2	mm
Specific gravity of particle	2.65	
Number of units	2	
Maximum flow/unit	61.7	cuft/s
Width of channel	10.3	ft
Depth of channel	4	ft
Length of channel	144	ft
Settling velocity of particle	0.0707	ft/s
Slope of channel bottom	0.000263	
Allowance for currents	1.7	
Manning coefficient	0.035	
Hydraulic retention time	1.6	min
Volume of grit	141	cuft/d
Costs		
Construction and equipment cc	2450000	$
Operational labor cost	296000	$/yr
Maintenance labor cost	118000	$/yr
Material and supply cost	61300	$/yr
Chemical cost	0	$/yr
Energy cost	8320	$/yr
Amortization cost	206000	$/yr

Contact Stabilization Activated Sludge

Design Output Data

Description	Value	Units
Contact Stabilization Activated Sludge		
Design Information		
Calculated SRT for design	15	d
Average SS	3880	mg/L
Average VSS	2870	mg/L
Calculated VSS:TSS ratio	0.74	mg VSS/mg SS
Total volume of reactors	39300	m3
Volume of contact tank	11200	m3
Volume of stabilization tank	28100	m3
Length of parallel train	79	m
Width of parallel train	10	m
Sidewater depth	5	m
Number of batteries	1	
Number of parallel trains per b	10	
F/M ratio	0.0239	lb BOD/lb MLSS/d
Volumetric BOD loading	0.0686	kg BOD/m3/d
Observed yield (VSS basis)	4.18	g VSS/g BOD
Observed yield (TSS basis)	5.65	g TSS/g BOD
Amount of sludge generated	11200	kg/d
Sludge recycle rate	85300	m3/d
Nitrogen requirement for biom	5.58	mg/L
Phosphorus requirement for bi	1.12	mg/L
Oxygen requirement to meet a	3370	kg/d
Air flow required to meet avera	17300	N m3/hr
Design air flow	7.36	N m3/min/1000 m3
Quantities		
Operation labor required	2790	pers-hrs/yr
Maintenance labor required	1600	pers-hrs/yr
Electrical energy required	2640000	kWh/yr
Volume of earthwork required	652000	cuft
Volume of slab concrete requir	211000	cuft
Volume of wall concrete requir	119000	cuft
Handrail length	4070	ft
Number of diffusers per train	514	
Fine bubble diffuser floor cover	2.67	%
Number of swing arm headers	11	
Costs		
Construction and equipment cc	10200000	$
Earthwork Cost	193000	$
Wall Concrete Cost	2870000	$
Slab Concrete Cost	2740000	$
Handrail Cost	305000	$
Installed Aerator Equipment	2530000	$

Air Piping Cost	595000	$
Misc Costs	1010000	$
Operational labor cost	144000	$/yr
Maintenance labor cost	76700	$/yr
Material and supply cost	144000	$/yr
Chemical cost	0	$/yr
Energy cost	264000	$/yr
Amortization cost	928000	$/yr
Sludge Recycle Pumping		
Design Information		
Average daily pumping rate	35.6	MGD(US)
Total pumping capacity	35.6	MGD(US)
Design capacity per pump	12400	gpm(US)
Number of pumps	3	
Number of batteries	1	
Firm pumping capacity	35.6	MGD(US)
Quantities		
Operation labor required	894	pers-hrs/yr
Maintenance labor required	860	pers-hrs/yr
Electrical energy required	1180000	kWh/yr
Volume of earthwork required	7220	cuft
Area of pump building	902	sqft
Costs		
Construction and equipment cc	656000	$
Earthwork Cost	2140	$
Pump Building Cost	99200	$
Installed Pump Cost	454000	$
Misc Costs	100000	$
Operational labor cost	46000	$/yr
Maintenance labor cost	41300	$/yr
Material and supply cost	4590	$/yr
Chemical cost	0	$/yr
Energy cost	118000	$/yr
Amortization cost	62000	$/yr

Anaerobic Digestion

Design Output Data

Description	Value	Units
Anaerobic Digestion		
Design Information		
Percent VSS destroyed	50	%
Solids concentration in digeste	5	%
Detention time	25	d
Digester depth	29.7	ft
Digester diameter	80	ft
Effective digester volume	1330000	cuft
Number of digesters per batter	8	
Number of primary digesters p	5	
Number of secondary digester:	3	
Number of batteries	1	
Gas produced	290	cuft/min
Heat required	8100000	BTU/hr
Digester gas required	313	cuft/min
Total natural gas required	2350000	cuft/yr
Quantities		
Operation labor required	5870	pers-hrs/yr
Maintenance labor required	3670	pers-hrs/yr
Electrical energy required	556000	kWh/yr
Volume of earthwork required	1320000	cuft
Slab thickness	11.4	in
Volume of slab concrete requir	41500	cuft
Wall thickness	22.4	in
Volume of wall concrete requir	135000	cuft
Sidewater depth	29.7	ft
Surface area/floor of 2-story cc	6140	sqft
Piping size	10	in
Length of total piping system	2910	ft
Number of 90 degree elbows	104	
Number of tees	204	
Number of plug valves	148	
Total dry solids treated	37.3	ton(short)/d
Costs		
Construction and equipment cc	20300000	$
Earthwork Cost	393000	$
Wall Concrete Cost	3240000	$
Slab Concrete Cost	537000	$
Building Cost	676000	$
Piping System Cost	2100000	$
Floating Cover Cost	7370000	$
Gas Recirculation Units Cost	1540000	$
Heating Units Cost	1270000	$
Gas Safety Equipment Cost	598000	$

Installed Pumps Cost	599000	$
Operational labor cost	302000	$/yr
Maintenance labor cost	177000	$/yr
Material and supply cost	211000	$/yr
Chemical cost	0	$/yr
Energy cost	95500	$/yr
Amortization cost	1930000	$/yr

Influent Pump Station

Design Output Data

Description	Value	Units
Pump Station		
Design Information		
Volume of wet well	350000	cuft
Width of wet well	1470	ft
Depth of the pumping station	37.2	ft
Length of the pumping station	34.8	ft
Width of the pumping station	1520	ft
Minimum depth of water in wet	16.2	ft
Area of pump building	1780	sqft
Peak capacity of pumps	98	MGD(US)
Firm pumping capacity	98	MGD(US)
Total dynamic head - average	43.7	ft
Quantities		
Operation labor required	2210	pers-hrs/yr
Maintenance labor required	1730	pers-hrs/yr
Electrical energy required	913000	kWh/yr
Volume of earthwork required	6950000	cuft
Volume of slab concrete requir	723000	cuft
Volume of wall concrete requir	163000	cuft
Capacity per pump	68100	gpm(US)
Number of constant speed pur	2	
Number of variable speed pur	0	
Diameter of discharge header	59	in
Total dynamic head	50.4	ft
Size of selected pump	54	in
Specific speed of pump	8270	
Pump rotating speed	290	rpm
Motor size required	381	HP
Size of selected motor	400	HP
Width of pump system	11.4	ft
Length of pump system	39.7	ft
Length of the dry well	34.8	ft
Width of the dry well	48.7	ft
Costs		
Construction and equipment co	20500000	$
Earthwork Cost	2060000	$
Wall Concrete Cost	3910000	$
Slab Concrete Cost	9370000	$
Building Cost	196000	$
Installed Pump Equipment C	1800000	$
Misc Costs	3120000	$
Operational labor cost	114000	$/yr
Maintenance labor cost	83300	$/yr
Material and supply cost	143000	$/yr
Chemical cost	0	$/yr
Energy cost	91300	$/yr
Amortization cost	1740000	$/yr

Secondary Clarifier

Design Output Data

Description	Value	Units
Secondary Clarification		
Design Information		
Surface area	89000	sqft
Surface area per circular clarifi	11100	sqft
Diameter of each circular clarif	120	ft
Number of clarifiers per battery	8	
Number of batteries	1	
Solids loading rate	21.1	lb/(sqft·d)
Hydraulic retention time	4.04	hr
Designed surface overflow rate	400	gal(US)/(sqft·d)
Weir length	5370	ft
Volume of wasted sludge	627000	gpd(US)
Quantities		
Operation labor required	3820	pers-hrs/yr
Maintenance labor required	2140	pers-hrs/yr
Electrical energy required	29100	kWh/yr
Volume of earthwork required	1290000	cuft
Slab thickness	10.2	in
Volume of slab concrete requir	85800	cuft
Wall thickness	11.5	in

Volume of wall concrete requir	31400	cuft
Costs		
Construction and equipment cc	4310000	$
Earthwork Cost	383000	$
Wall Concrete Cost	755000	$
Slab Concrete Cost	1110000	$
Installed Equipment Cost	1400000	$
Misc Costs	658000	$
Operational labor cost	197000	$/yr
Maintenance labor cost	103000	$/yr
Material and supply cost	43100	$/yr
Chemical cost	0	$/yr
Energy cost	2910	$/yr
Amortization cost	391000	$/yr
Waste Sludge Pumping		
Design Information		
Average daily pumping rate	0.627	MGD(US)
Total pumping capacity	0.627	MGD(US)
Design capacity per pump	218	gpm(US)
Number of pumps	3	
Number of batteries	1	
Firm pumping capacity	0.627	MGD(US)
Quantities		
Operation labor required	414	pers-hrs/yr
Maintenance labor required	336	pers-hrs/yr
Electrical energy required	21000	kWh/yr
Volume of earthwork required	1700	cuft
Area of pump building	212	sqft
Costs		
Construction and equipment cc	75200	$
Earthwork Cost	503	$
Pump Building Cost	23400	$
Installed Pump Cost	39900	$
Misc Costs	11500	$
Operational labor cost	21300	$/yr
Maintenance labor cost	16100	$/yr
Material and supply cost	527	$/yr
Chemical cost	0	$/yr
Energy cost	2100	$/yr
Amortization cost	7110	$/yr

Belt-Filter Press

Design Output Data

Description	Value	Units
Belt-Filter Press		
Design Information		
Belt filter width	2	m
Number of units	3	
Hydraulic loading per unit per r	70	gpm(US)
Hydraulic loading required per	312	gpm(US)
Final solids content	19	%
Solids capture fraction	0.998	
Quantities		
Operation labor required	1490	pers-hrs/yr
Maintenance labor required	372	pers-hrs/yr
Power	389000	kWh/yr
Polymer required	196000	lb/yr
Dry solids produced	53600	lb/d
Belt filter(s)	903000	$
Building	393000	$
Installation	226000	$
Polymer system	334000	$
Feed pumps	99300	$
Conveyor system	226000	$
Costs		
Construction and equipment cc	2180000	$
Building Cost	393000	$
Polymer System Cost	334000	$
Feed Pumps Cost	99300	$
Conveyor System Cost	226000	$
Installed Belt Filter	1130000	$
Operational labor cost	76600	$/yr
Maintenance labor cost	17900	$/yr
Material and supply cost	0	$/yr
Chemical cost	254000	$/yr
Energy cost	38900	$/yr
Amortization cost	203000	$/yr

Primary Clarification

Design Output Data

Description	Value	Units
Primary Clarification		

Design Information		
Surface area	44800	sqft
Surface area per circular clarifi	5600	sqft
Diameter of each circular clarif	85	ft
Number of clarifiers per battery	8	
Number of batteries	1	
Solids loading rate	2.73	lb/(sqft·d)
Hydraulic retention time	2.02	hr
Weir length	8080	ft
Volume of sludge generated	213000	gpd(US)
Quantities		
Operation labor required	2520	pers-hrs/yr
Maintenance labor required	1410	pers-hrs/yr
Electrical energy required	19500	kWh/yr
Volume of earthwork required	586000	cuft
Slab thickness	10.2	in
Volume of slab concrete requir	44200	cuft
Wall thickness	11.5	in
Volume of wall concrete requir	22500	cuft
Costs		
Construction and equipment co	2750000	$
Earthwork Cost	173000	$
Wall Concrete Cost	542000	$
Slab Concrete Cost	573000	$
Installed Equipment Cost	1040000	$
Misc Costs	420000	$
Operational labor cost	130000	$/yr
Maintenance labor cost	67500	$/yr
Material and supply cost	27500	$/yr
Chemical cost	0	$/yr
Energy cost	1950	$/yr
Amortization cost	253000	$/yr
Waste Sludge Pumping		
Design Information		
Average daily pumping rate	0.213	MGD(US)
Total pumping capacity	0.213	MGD(US)
Design capacity per pump	74	gpm(US)
Number of pumps	3	
Number of batteries	1	
Firm pumping capacity	0.213	MGD(US)
Quantities		
Operation labor required	361	pers-hrs/yr
Maintenance labor required	286	pers-hrs/yr
Electrical energy required	7170	kWh/yr
Volume of earthwork required	1630	cuft
Area of pump building	204	sqft
Costs		
Construction and equipment co	56400	$
Earthwork Cost	484	$
Pump Building Cost	22500	$
Installed Pump Cost	24800	$
Misc Costs	8600	$
Operational labor cost	18600	$/yr
Maintenance labor cost	13800	$/yr
Material and supply cost	394	$/yr
Chemical cost	0	$/yr
Energy cost	717	$/yr
Amortization cost	5330	$/yr

Drying Beds

Design Output Data

Description	Value	Units
Sludge Drying Beds		
Design Information		
Total surface area required	386000	sqft
Initial depth of sludge	12	in
Final solids	50	%
Bed holding time	103	d
Quantities		
Total drying bed surface area	386000	sqft
Number beds	129	
Surface area of each individua	2990	sqft
Length of each bed	149	ft
Volume of earthwork required	1900000	cuft
Volume concrete for dividing w	124000	cuft
Volume of R.C. in-place for tru	28900	cuft
Volume of sand	289000	cuft
Volume of gravel	386000	cuft
Clay pipe diameter	6	in
Total length clay pipe	38600	in
Sludge solids produced	22.3	ton(short)/d
Operational labor required	23800	pers-hrs/yr

Maintenance labor required	11900	pers-hrs/yr
Costs		
Construction and equipment cc	5340000	$
Earthwork Cost	562000	$
Wall Concrete Cost	2100000	$
Slab Concrete Cost	225000	$
Drying Bed Media Cost	1080000	$
Drain Pipe System Cost	848000	$
Misc Costs	529000	$
Operational labor cost	1220000	$/yr
Maintenance labor cost	570000	$/yr
Material and supply cost	48000	$/yr
Chemical cost	0	$/yr
Energy cost	0	$/yr
Amortization cost	465000	$/yr

Trickling Filter

Design Output Data

Description	Value	Units
Trickling Filtration		
Design Information		
Reaction rate constant	0.00156	
Hydraulic loading rate	0.75	gal(US)/(sqft·min)
Total hydraulic loading rate	0.752	gal(US)/(sqft·min)
Recirculation ratio	0.00313	
Number of towers per stage	2	
Number of stages	2	
Depth of filter tower	20.6	ft
Diameter of filter tower	145	ft
Surface area per filter tower	8240	sqft
Total surface area	33000	sqft
Volume per filter tower	340000	cuft
Total volume	1360000	cuft
Quantities		
Operation labor required	1610	pers-hr/yr
Maintenance labor required	998	pers-hr/yr
Volume of earthwork required	1010000	cuft
Volume of slab concrete requir	43900	cuft
Volume of wall concrete requir	46200	cuft
Number of posts per tower	1120	
Total length of precast beams	36400	ft
Costs		
Construction and equipment cc	14800000	$
Earthwork Cost	300000	$
Wall Concrete Cost	1110000	$
Slab Concrete Cost	570000	$
Concrete Beam Cost	1460000	$
Media Cost	7740000	$
Installed Distributor Arm Cos	626000	$
Misc Costs	2950000	$
Operational labor cost	83000	$/yr
Maintenance labor cost	48000	$/yr
Material and supply cost	83700	$/yr
Chemical cost	0	$/yr
Energy cost	2440	$/yr
Amortization cost	1250000	$/yr
Internal Recycle Pumping		
Design Information		
Average daily pumping rate	80.6	MGD(US)
Total pumping capacity	80.6	MGD(US)
Design capacity per pump	18700	gpm(US)
Number of pumps	4	
Number of batteries	1	
Firm pumping capacity	80.6	MGD(US)
Quantities		
Operation labor required	1810	pers-hrs/yr
Maintenance labor required	1460	pers-hrs/yr
Electrical energy required	2670000	kWh/yr
Volume of earthwork required	14300	cuft
Area of pump building	1790	sqft
Costs		
Construction and equipment cc	1390000	$
Earthwork Cost	4240	$
Pump Building Cost	197000	$
Installed Pump Cost	977000	$
Misc Costs	212000	$
Operational labor cost	93200	$/yr
Maintenance labor cost	70200	$/yr
Material and supply cost	9730	$/yr
Chemical cost	0	$/yr
Energy cost	267000	$/yr
Amortization cost	131000	$/yr

Chlorination

Design Output Data

Description	Value	Units
Chlorination		
Design Information		
Volume of tank	3330000	gal(US)
Average chlorine required	2920	lb/d
Peak chlorine required	6670	lb/d
Influent coliform count	10000000	/100ml
Effluent coliform count	3.72	/100ml
Quantities		
Operational labor required	2810	pers-hrs/yr
Maintenance labor required	1220	pers-hrs/yr
Electrical energy required	168000	kWh/yr
Volume of earthwork required	184000	cuft
Volume of slab concrete requir	44700	cuft
Volume of wall concrete requir	49800	cuft
Number of chlorinators and ev	1	
Chlorination building area	360	sqft
Number of chlorine cylinders	44	
Area of chlorine storage buildir	6160	sqft
Costs		
Construction and equipment co	3630000	$
Earthwork Cost	54500	$
Wall Concrete Cost	1200000	$
Slab Concrete Cost	579000	$
Installed Equipment Cost	1090000	$
Building Cost	39600	$
Storage Building Cost	339000	$
Misc Costs	330000	$
Operational labor cost	145000	$/yr
Maintenance labor cost	58700	$/yr
Material and supply cost	84800	$/yr
Chemical cost	692000	$/yr
Energy cost	16800	$/yr
Amortization cost	341000	$/yr

Hauling and Land Filling

Design Output Data

Description	Value	Units
Sludge Hauling and Land Filling		
Design Information		
Volume of sludge hauled	52.9	cuyd/d
Truck capacity	30	cuyd
Round trip time to disposal site	1	hr
Truck loading time	0.75	hr
Operational hours per day	8	hr
Number of trucks required	1	
Distance to disposal site	10	miles
Quantities		
Total sludge volume hauled	52.9	cuyd/d
Maximum anticipated landfill d	30	d
Anticipated sludge storage hei	8	ft
Sludge storage shed area	5360	sqft
Width of sludge storage shed s	51.8	ft
Length of sludge storage shed	104	ft
Volume of earthwork required	14400	cuft
Volume of slab concrete requir	6070	cuft
Surface area of canopy roof	5360	sqft
Round trip haul distance	20	miles
Round trips per day per truck	2	
Distance traveled per year per	10000	miles
Sludge hauled	46.8	ton(short)/d
Operation labor required	827	pers-hrs/yr
LandFilling cost	35200	$/yr
Costs		
Construction and equipment co	549000	$
Earthwork Cost	4260	$
Slab Concrete Cost	78700	$
Canopy Roof Cost	107000	$
Vehicle Cost	359000	$
Operational labor cost	42600	$/yr
Maintenance labor cost	0	$/yr
Material and supply cost	71800	$/yr
Chemical cost	0	$/yr
Energy cost	0	$/yr
Amortization cost	93600	$/yr

Effluent

Design Output Data

Description	Value	Units

Costs		
Construction and equipment cc	0	$
Operational labor cost	0	$/yr
Maintenance labor cost	0	$/yr
Material and supply cost	0	$/yr
Chemical cost	0	$/yr
Energy cost	0	$/yr
Amortization cost	0	$/yr