



Appendix D- Equipment Sizing

- D.1 Tank Sizing
- D.2 Pump Sizing (Dosing Pumps)
- D.3 Pond Sizing
- D.4 IX Column Sizing



D.1 Tank Sizing

Equipment Tank Sizing

Project Roca Honda Water Treatment Plant
 Client Roca Honda Resources
 Lyntek Proj. #: 10034
 Date: 16-Aug-10
 Creator: N Janisch
 Edited By: Daniel Trump
 Date: 9/7/2010
 Checked By: B. Alexander 9/8/10

Key:

Design Value
Calculated Value

*Tank Calculations set the design values and calculate the required volumes and dimensions to meet the design values

*Tank Specs Call out the actual Tank Dimensions and Properties

Reaction Tank #1 & #2 Calculations	30-TK-20 & 30	
Retention Time per Tank	5	min
Throughput	8000	gpm
Volume Required	40000	gallons
Total Volume	5348	Cuft
Tank Requirements		
Diameter	18.95	ft
height	18.95	ft

Reaction Overflow Tank Calculations	30-TK-40	
Retention Time per Tank	1	min
Throughput	8000	gpm
Volume Required	8000	gallons
Total Volume	1070	Cuft
Tank Requirements		
Diameter	11.08	ft
height	11.08	ft

Reaction Tank Specs	30-TK-20 & 30	
Diameter	20	ft
Height	25	ft
FreeBoard	3	cuft
Tank Volume	7854	cuft
Operating Tank Volume	6912	cuft
Retention Time	6.5	min
Agitator	Yes	
Tank mounted Agitator Support	NO	
Baffles	Yes (11% of diam)	
Inlet	Top of Tank	
Outlet	TBD	
Outlet Height	TBD	

Reaction Overflow Tank Specs	30-TK-40	
Diameter	12	ft
Height	20	ft
FreeBoard	3	ft
Tank Volume	2262	cuft
Operating Tank Volume	1923	cuft
Retention Time	1.8	min
Agitator	NO	
Tank mounted Agitator Support	NO	
Baffles	NO	
Inlet	Top of Tank	
Outlet	TBD	
Outlet Height	TBD	

BaCl ₂ Mix Tank Calculations	30-TK-10	
Retention Time	24	hour
BaCl ₂ Concentration	10%	
BaCl ₂ Dosing	15	mg/L
BaCl ₂ Consumption	1.0	lb/min
Slurry Consumption	10.01511	lb/min
Density of Slurry	9.76	lb/gal
Throughput	1.03	gpm
	61.57	gph
Volume Required	1,478	gallons
Volume Required	198	cuft
Tank Requirements		
Diameter	6.31	ft
Height	6.31	ft

D.E. Mix Tank Calculations	40-TK-10	
DE Loading	20	lb/100sqft
Loading % D.E.	2%	
Leaf Filter Area	2700	sqft
Total DE reqd for precoat	540	lbs
Total Soln weight	27000	lbs
10% SG soln	1.1	
Vol of Soln	2941	gal
Vol of Soln	393	Cuft
Tank Requirements		
Min Diameter	7.9	ft
Min Height	7.9	ft

BaCl ₂ Mix Tank Specs	30-TK-10	
Diameter	6	ft
Height	8	ft
Freeboard	1.5	ft
Tank Volume	226	cuft
Operating Volume	184	cuft
Retention Time	22.3	hr
Agitator (side mounted)	YES	
Tank mounted Agitator Support	YES	
Baffles	NO	
Inlet	Top of Tank	
Outlet	TBD	
Outlet Height	TBD	

D.E. Mix Tank Specs	40-TK-10	
Diameter	8	ft
Height	10	ft
FreeBoard	2	ft
Tank Volume	503	cuft
Operating Tank Volume	402	cuft
Retention Time	NA	
Agitator	Yes	
Tank mounted Agitator Support	NO	
Baffles	Yes (11% of diam)	
Inlet	Top of Tank	
Outlet	TBD	
Outlet Height	TBD	

Resin Transfer Water Tank Calculations	20-TK-10	
Transfer Volume Required	10152	gal
Transfer Volumes	2	
Volume Required	20303	gallons
Total Volume	2714	Cuft
Tank Requirements		
Diameter	15.12	ft
height	15.12	ft

Resin Transfer Water Tank Specs	20-TK-10	
Diameter	15	ft
Height	17	ft
FreeBoard	2	ft
Tank Volume	3004	cuft
Operating Tank Volume	2651	cuft
	19827.4	gal
Resin Tank Volumes	2.0	
Agitator	NO	
Tank mounted Agitator Support	NO	
Baffles	NO	
Inlet	Top of Tank	
Outlet	TBD	
Outlet Height	TBD	



D.2 Pump Sizing (Dosing Pumps)

Pump Sizing

Project Roca Honda Water Treatment Plant
 Client Roca Honda Resources
 Lyntek Proj. #: 10034
 Date: 2-Sep-10
 Creator: Daniel Trump
 Updated by: Daniel Trump
 Date: 9/20/2010

<u>Equipment Tag</u>	<u>Description</u>	<u>Type</u>	<u>VFD</u>	<u>NPSHa</u>	<u>head (ft)</u>	<u>Flow (gpm)</u>
10-PP-30	IX column Feed	Double Suction	yes		175	4000
10-PP-40	IX column Feed	Double Suction	no		175	4000
20-PP-10	Resin Transfer	Recessed Impeller	no		75	100
20-PP-20	Containment Area Sump Pump	Sump Pump	no		100	200
20-PP-30	Resin Transfer Area Sump Pump	Sump Pump	no		100	200
30-PP-10	Leaf Filter Feed Pump	Centrifugal	yes		175	4000
30-PP-20	Leaf Filter Feed Pump	Centrifugal	no		175	4000
30-PP-30	Barium Chloride Metering Pump	Slurry Pump meter	yes		50	100
30-PP-40	Barium Chloride Metering Pump	Slurry Pump meter	yes		50	0 to 2
30-PP-50	Reaction tank Area Sump Pump					
40-PP-10	Filter Backwash Pump	Centrifugal	no		320	320
40-PP-10	Filter Backwash Pump	Centrifugal	no		320	320
40-PP-20	DE Body feed	Slurry Pump	yes		125	0 to 2
40-PP-20	DE Body feed	Slurry Pump	yes		125	0 to 2
40-PP-30	DE Pre-coat Pump	Slurry Pump	no		75	1500
50-PP-10	Evaporation Pond Sump	Vert Turbine Sump	no	25 ft	75	40
50-PP-20	Evaporation Pond Sump	Vert Turbine Sump	no	25 ft	75	40
50-PP-30	Evaporation Pond Sump	Vert Turbine Sump	no	25 ft	75	40
50-PP-40	Evaporation Pond Sump	Vert Turbine Sump	no	25 ft	75	100
50-PP-50	Evaporation Pond Sump	Vert Turbine Sump	no	25 ft	75	100
50-PP-60	Evaporation Pond Sump	Vert Turbine Sump	no	25 ft	75	100
50-PP-70	Evaporation Pond Sump	Vert Turbine Sump	no	25 ft	75	100



D.3 Pond Sizing

Pond Sizing

Project Roca Honda Water Treatment Plant
 Client Roca Honda Resources
 Lyntek Proj. #: 10034
 Date: 16-Aug-10
 Creator: N Janisch
 Edited By Daniel Trump
 Date: 9/2/2010

Conversions

7.48 gal per cuft
 43560 gal per acre ft

Settling Ponds		
Retention Time	2	hour
Throughput	4,000	gpm
Volume Required	480,000	gallons
	1.47	acre ft

Discharge Holding Ponds #1		
Retention Time	1.2	hour
Number of Ponds	2	
Throughput	4,000	gpm
Volume Required per pond	288,000	gallons
	0.88	acre ft

Filter Backwash Ponds		
Total Backwashes	50	
Filter Backwash Volume	5,500	gal
Volume Required	275,000	gallons
	0.84	Acre ft

*Filter Backwash ponds will be utilized by the backwash system from the clarifying leaf filters. They are sized based on the expected amount of washdown water required by the filters



D.4 IX Column Sizing

IX Column Sizing

Project Roca Honda Water Treatment Plant
Client Roca Honda Resources
Lyntek Proj. #: 10034
Date: 2-Sep-10
Creator: Daniel Trump
Edited By
Date:

Key:

Design Value

Calculated Value

IX Column Sizing		20-IX-10 to 80
Plant Flow	8000	
Capacity	10	gpm/sqft
Column Diameter	12	ft
Column Area	113.1	sqft
Column Flow	1131.0	gpm/column
Required Columns	7.1	columns