



**Crystal Environmental**



**5th Annual Waste  
Treatment Symposium**

# **EQUALIZATION & STORAGE**

**Wednesday,  
September 15, 2010**





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# **Therese Wheaton**



*How Can We make the Process EASY?*

*“Specializing in Industrial and Municipal  
Solids-Liquid Separation”*





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Learn from the Mistakes of Others...



Don't take the time to make them yourself!





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Learn from the Mistakes of Others...



**OOPS!**





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Learn from the Mistakes of Others...



Are you ready for some experience?





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## EQUALIZATION & STORAGE

- Homogenize Loads in Tanks
- This Makes Each Batches Similar
- IN: Offload Truck at 200-400 GPM
- Equalize / Mix / Agitate
- OUT: Process Waste 30-200 GPM
- Homogenizes your Solid and Liquid Results
- Minimizes your Chemical Use...\$\$\$\$\$





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## INFLUENT TO EFFLUENT VALUES

- TSS...Total Suspended Solids
- FOG...Fats, Oils & Grease
- BOD...Biological Oxygen Demand
- CBOD...Quick Test for BOD...Operational Indicator
- pH... Alkalinity or Acidity Range
- Metals for Solid or Liquid Discharge
- Combined Nitrogen; Phosphorus, Chloride, Sodium?





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## **WHY IS EQUALIZATION & STORAGE IMPORTANT?**

- **Attenuates the Flow**
- **Minimizes Human Error**
- **Provides for a Consistent Result**
- **Buffers Off-Loading & Operations**
- **Allows for a More Automated Result**
- **Equalization Optimizes Chemical Use**
- **Lack of Water Quality Can Shut You Down!**
- **WATER QUALITY KEEPS YOUR DOORS OPEN!**







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## WHY IS EQUALIZATION & STORAGE IMPORTANT?





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## WHY IS EQUALIZATION & STORAGE IMPORTANT?





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**SEE US FOR MORE  
INFORMATION ON  
YOUR "GAME PLAN"**



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Specializing in Industrial & Municipal Solids-Liquids Separation since 1992.

**LAD Processing, LLC - PolyWick Lab Results**

DATE	BOD		TSS		Chloride	
	ppm-in	ppm-out	ppm-in	ppm-out	ppm-in	ppm-out
4/2/00	3,070	811	7,500	79	1,100	1,000
4/3/00						
4/4/00						
4/5/00	1,000	1,000	4,700	204	1,000	1,000
4/6/00	4,000	1,100	4,070	128	1,000	700
4/7/00	1,700	1,000	1,000	81	1,000	1,000
4/8/00						
4/9/00	4,700	1,140	4,740	108	1,000	1,000
4/10/00	711	2,000	1,000	100		
4/11/00						
4/12/00	2,700	1,040	1,000	176	400	400
4/13/00	1,000	90	1,000	90	900	90
4/14/00						
4/15/00	1,000	714	1,000	40	800	800
4/16/00	1,000	1,000	500	120	1,000	300
4/17/00	4,000	1,000	4,000	100	400	300
4/18/00						
4/19/00	1,000	1,000	1,000	140	100	100
4/20/00	700	300	2,070	180	170	100
4/21/00	4,400	1,000	1,000	80	800	400
4/22/00	1,000	1,040	4,000	30	400	300
4/23/00	940	711	100	440	100	100
4/24/00						
4/25/00						
4/26/00	1,000	200	4,000	300	100	100
4/27/00	4,000	1,000	4,224	140	700	400
4/28/00	900	811	300	100	200	200
4/29/00	71,000	1,000	4,000	300	1,000	200
4/30/00	1,000	80	1,000	100	100	100
5/1/00						
5/2/00						
5/3/00	2,400	1,200	4,000	100	400	300
5/4/00	1,000	1,000	90	100	900	400
Average	1,000	1,000	2,700	211	1,000	400
Reduction	<b>63%</b>		<b>94%</b>		<b>54%</b>	

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## Be Prepared!



*How Can We make the Process EASY?*

*Prepare the Liquid Prior to Equalization!*





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**SCREENING**



**PARTICLE SIZE = 3/8" X 3/8"**

**GRINDING IS A VIABLE OPTION**





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**PRE-SCREENING & GRIT REMOVAL**





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**GRIT REMOVAL**



**YOU MAY FIND:**

**15 - 30 YARDS OF GRIT PER MILLION**





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**THERESE'S RULE...**  
**DETERMINE YOUR DAILY FLOW**



**BUILD TWO TANKS...**







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## MODULATE YOUR EQUALIZATION FOR GROWTH



**MOST FACILITIES GROW QUICKLY!**





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**TANKS AROUND THE USA  
CAN YOU BURY THEM UNDERGROUND?**





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**TANKS AROUND THE USA  
CAN YOU BURY THEM UNDERGROUND?**





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**TANKS AROUND THE USA  
SIMPLE STORAGE**





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**TANKS AROUND THE USA  
SIMPLE STORAGE FOR LAND APPLICATION**





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**TANKS AROUND THE USA  
LINED LAGOONS**





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## TANKS AROUND THE USA





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**TANKS AROUND THE USA**







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## TANKS AROUND THE USA





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**CONCRETE TANKS**





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## **BOLTED TANKS**





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## **BOLTED TANKS WITH CONTAINMENT**





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## OTHER CONSIDERATIONS



Odor Control for Transfer Time





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## OTHER CONSIDERATIONS



Drain to a Sump Pit to Transfer!





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## OTHER CONSIDERATIONS



Pump with VFD to the Dewatering!





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## MIXING



Make good choices for optimum performance!







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## OTHER CONSIDERATIONS



Pumps to Mix / Equalize the Tanks





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# **MIXERS**





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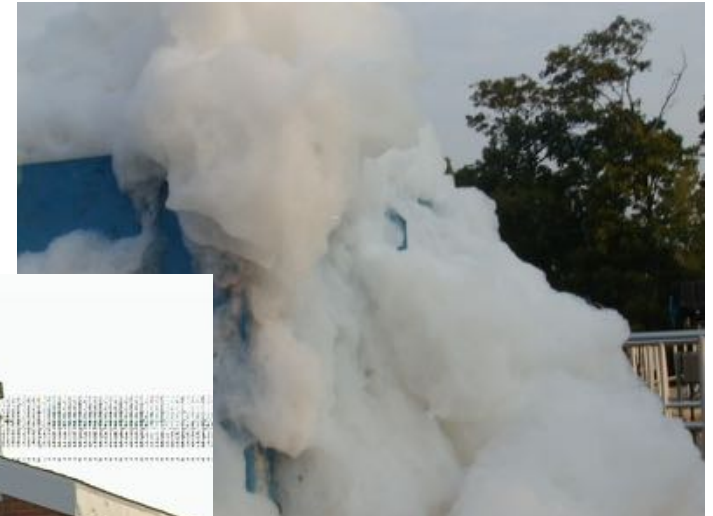
**MIXING SOME LIQUIDS CAN  
PRODUCE FOAM**





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## MIXING GONE WILD!





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## OTHER CONSIDERATIONS



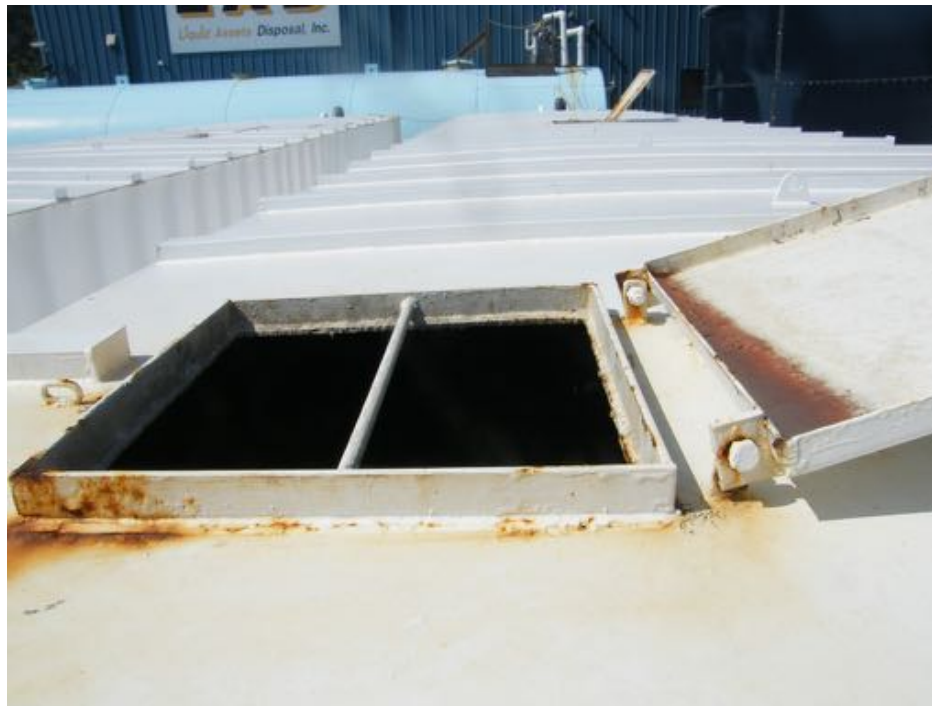
pH Monitoring vs. pH Guess work





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## OTHER CONSIDERATIONS



Accessibility for Cleaning & Maintenance!





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## OTHER CONSIDERATIONS



Do your Plans Make Sense?





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## CLIMATE CONSIDERATION



Inside or Outside...Check the Temperature!







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## SNEAK PEAK OF THE PLANT TOUR



## LAD PROCESSING EQUALIZATION TANKS





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**ACCESSIBLE WITH STAIR CASES**



**LAD PROCESSING EQUALIZATION TANKS**





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**PLUMBING IN VS. PLUMBING OUT**



**LAD PROCESSING EQUALIZATION TANKS**





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**MIXERS IN EACH TANK**



**LAD PROCESSING EQUALIZATION TANKS**





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**MORE STORAGE...**





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**MORE STORAGE...**





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**EQUALIZATION**

**LAD PROCESSING'S FINAL DISCHARGE TANKS**



**LOTS OF GALLONS +++++**





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## CONSIDER THE MATERIALS



- 316 Stainless Steel
- Galvanized Steel
- Painted Steel
- Coated Steel
- Aluminum
- Concrete
- Plastics







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## **LOOKING AT THE LARGE PICTURE... ...WHAT ARE THE COSTS?**

- Used: Nickel, Dime Quarter on the Dollar
- Buy a Site with Tanks
- Fabricated / Coated Steel \$1.00 to \$3.00 per Gallon
- Concrete: \$1.00 to \$3.00 per Gallon
- Covered or Uncovered? Odor Control or No Odor Control





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## **LOOKING AT THE LARGE PICTURE... ...STRESS RELIEVERS?**

- Use Pre-Manufactured / Pre-Engineered
- Perform Your Site Work
- New verses Used
- Location & Freight Costs
- Repair & Modification Costs
- Choose Experience...





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**QUESTIONS?**

**Therese Wheaton**

**[www.crystalenv.com](http://www.crystalenv.com)**



***CALL US FOR YOU CUSTOM TANK OPTIONS!***

***WE MODULATE...800-328-9720***

