

# McMinnville WRF 2014



# Recent WRF Expansion



# McMinnville WRF 2016



# ATAD DIGESTION



A very scientific experiment



UV System

Sand Filters

Tertiary Clarifiers

Secondary Clarifiers


Oxidation Ditches

Headwork's / Solids Processing

ATAD System

Bio-Filter

Biosolids Storage Tank

- 
- McMinnville's Population (2016) 33,080
  - Design dry weather flow 5.6 MGD
  - Average dry weather flow 3.1 MGD
  - Capacity of the WRF is 35 MGD
  - Secondary treatment capacity 35 MGD

- History of the ATAD system
- Fundamentals of the ATAD process
- Daily ATAD operations
- McMinnville's challenges

# What is an ATAD?

- Autothermal
- Thermophilic
- Aerobic
- Digester



# History

In 1968 Mr. Hubert K.E. Fuchs Sr., founder of FUCHS company, observed the strong autothermal conditions during the aeration of pig and poultry manure. This was the beginning of what was later called The ATAD process.

# Fuchs ATAD in Bavaria 1977



The Bavaria installation was followed by over 80 ATAD plants located in:

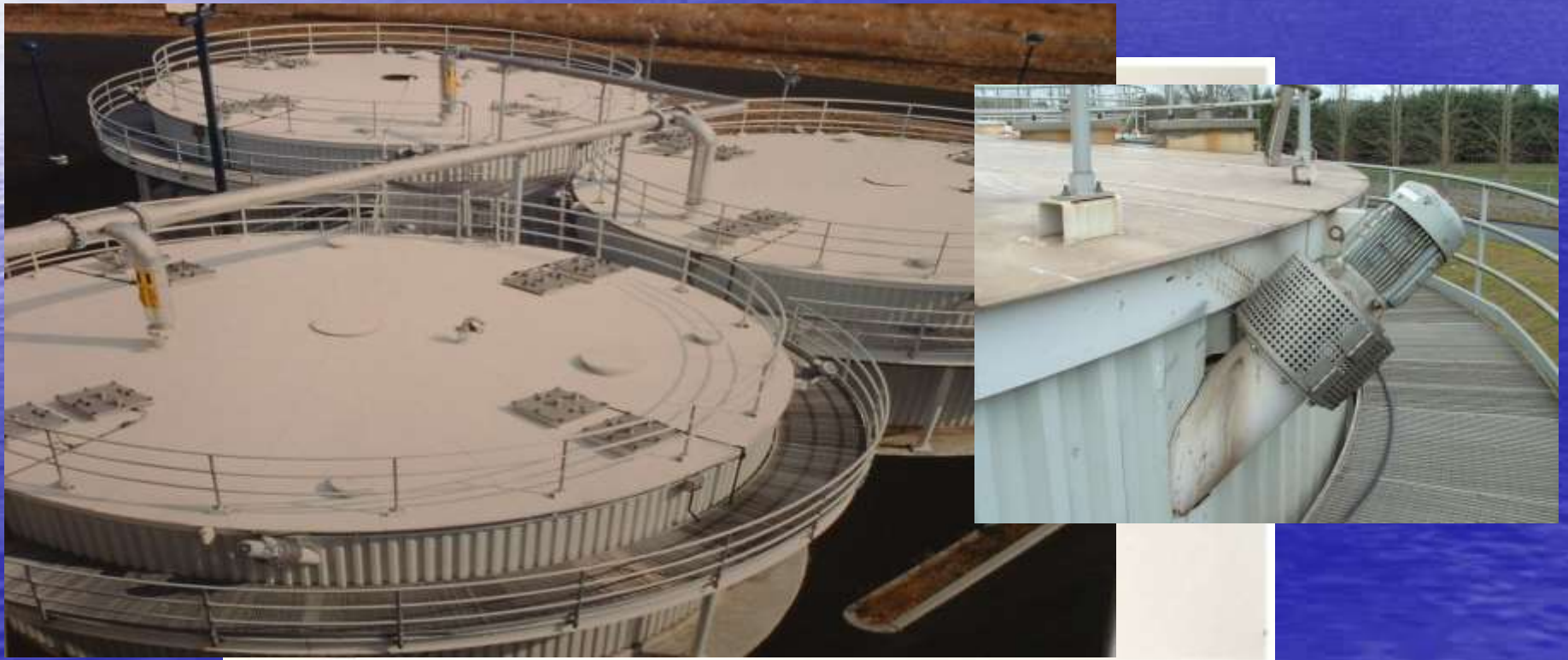
Germany, Australia, Austria, Canada, Great Britain, Hungary, Ireland, Israel, Luxembourg, Norway, Poland, South Korea, Switzerland and the USA.

# Optimal conditions to achieve thermophilic temperatures

- Volatile solids concentrations in the sludge of 2.5 -3.0 % to ensure high degradation rates.
- Insulated and covered reactors to minimize heat loss.
- Highly efficient aeration and mixing equipment to ensure a completely mixed aerobic environment.
- An effective foam control system to limit the foam layer in the reactor.

# The Spiral Aerators

Mounted tangentially through the wall of the reactor and provides vertical as well as horizontal mixing.



# Inside an ATAD



# Foam Controller



# Foam Chopper Blade

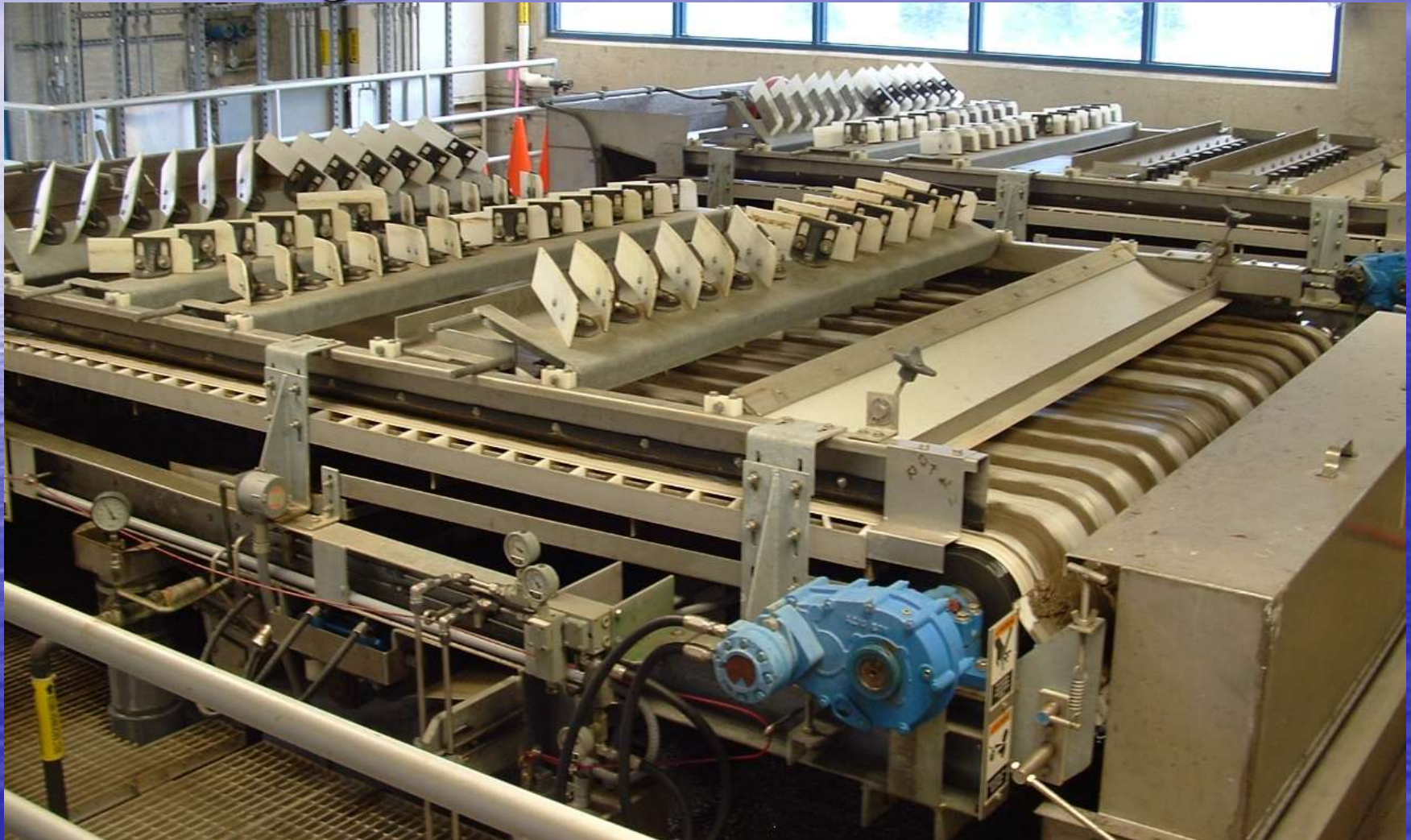




# Daily ATAD Transfer

# Waste Activated Sludge

- Thickened from 0.8% to 5% solid Prior to entering ATAD's



# DIGESTION / ATAD OVERVIEW

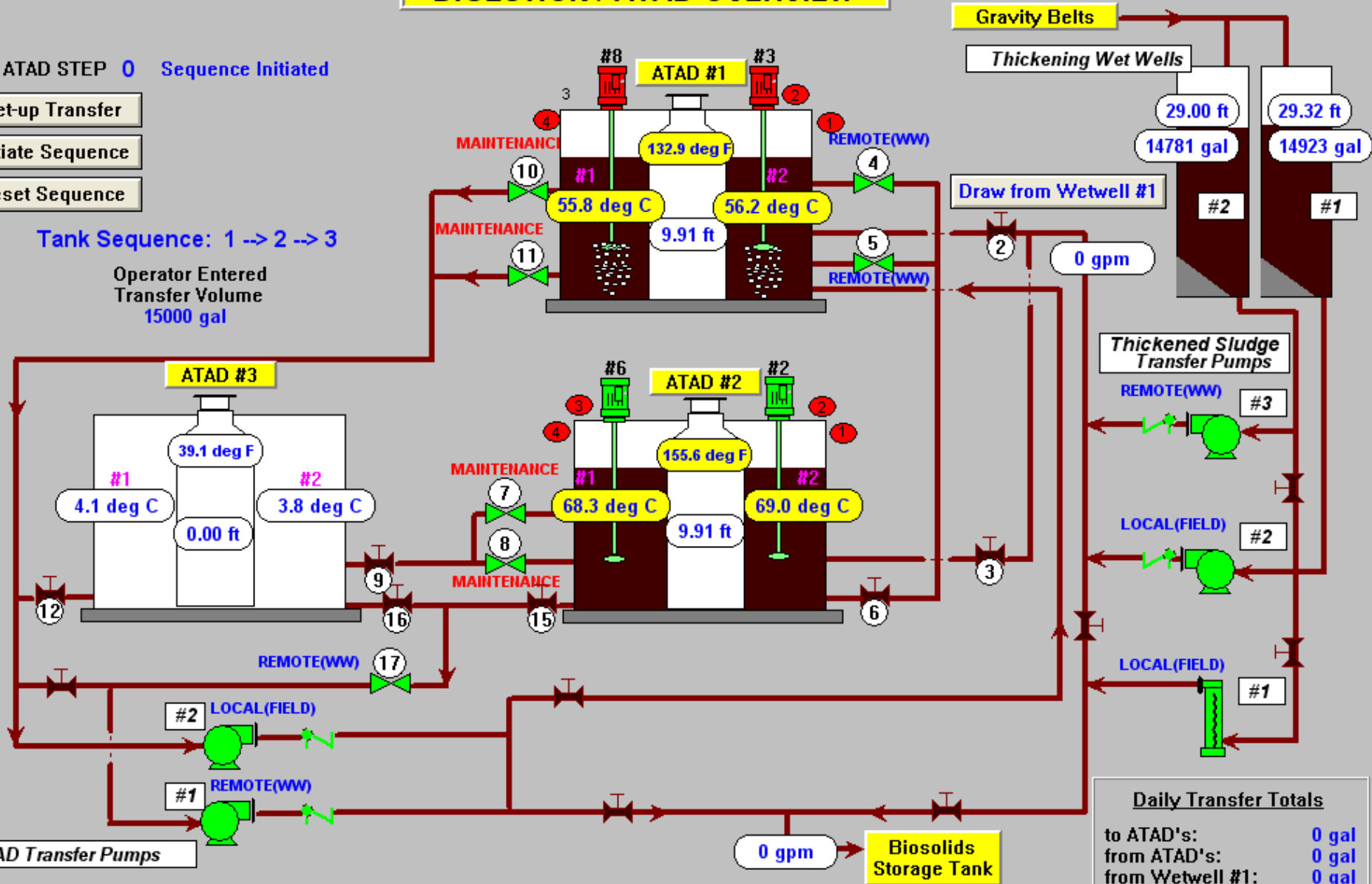
Print Screen

ATAD STEP 0 Sequence Initiated

- Set-up Transfer
- Initiate Sequence
- Reset Sequence

Tank Sequence: 1 --> 2 --> 3

Operator Entered  
Transfer Volume  
15000 gal



Daily Transfer Totals	
to ATAD's:	0 gal
from ATAD's:	0 gal
from Wetwell #1:	0 gal

User Access  
gehring Prgrmr.

City Overview	Overflow Status	Current Alarms	Display Menu	Start Daily Check	SQL
WRF Overview	Pump Station Status	Alarms / Events	Historical Trends	Daily Totals	

# DIGESTION / ATAD OVERVIEW

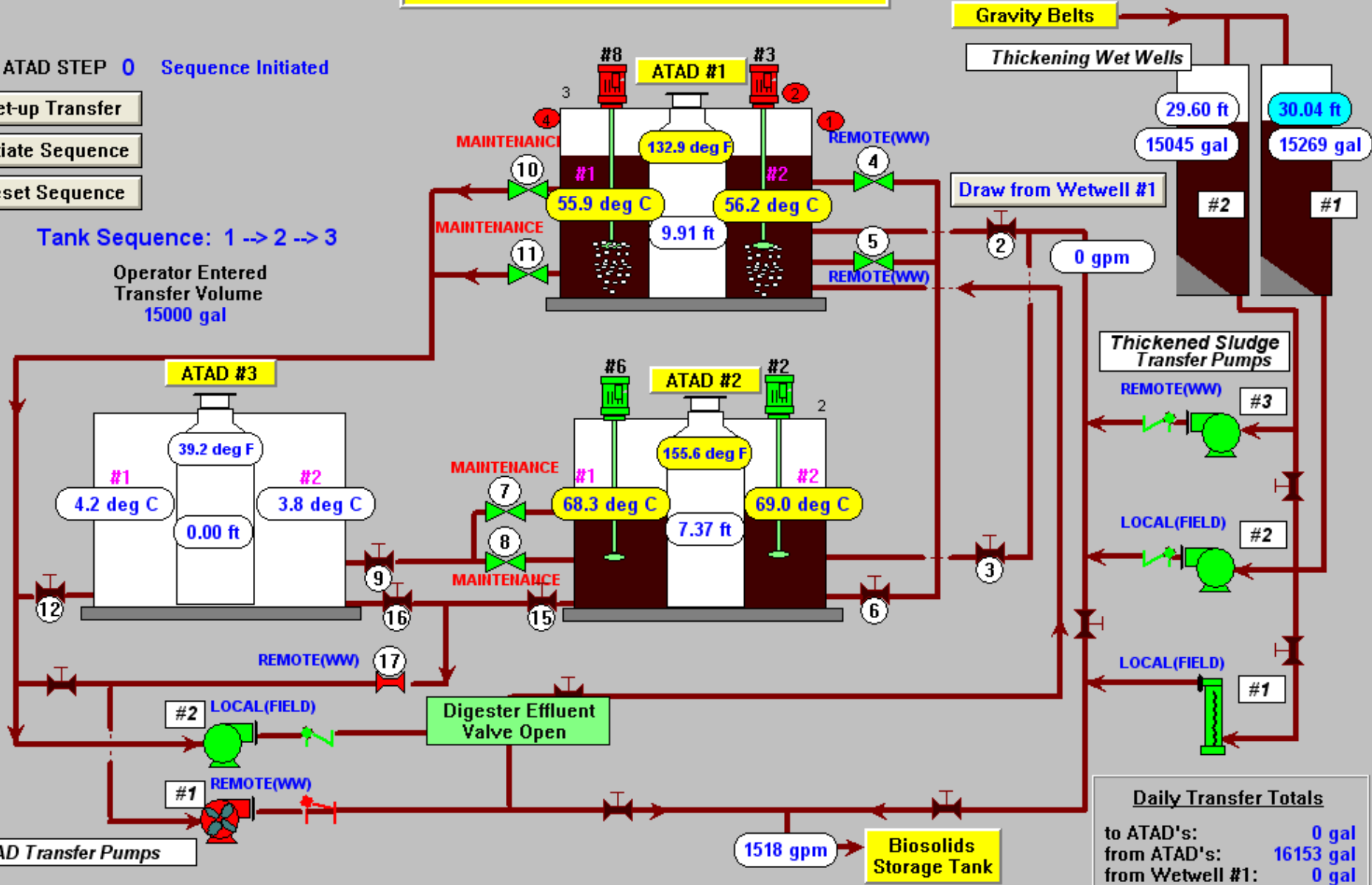
Print Screen

ATAD STEP 0 Sequence Initiated

- Set-up Transfer
- Initiate Sequence
- Reset Sequence

Tank Sequence: 1 -> 2 -> 3

Operator Entered  
Transfer Volume  
15000 gal



ATAD Transfer Pumps

1518 gpm → Biosolids Storage Tank

Daily Transfer Totals  
to ATAD's: 0 gal  
from ATAD's: 16153 gal  
from Wetwell #1: 0 gal

User Access  
gehring Prgrmr.

City Overview	Overflow Status	Current Alarms	Display Menu	Start Daily Check
WBE Overview	Pump Station Status	Alarms / Events	Historical Trends	Daily Totals

# DIGESTION / ATAD OVERVIEW

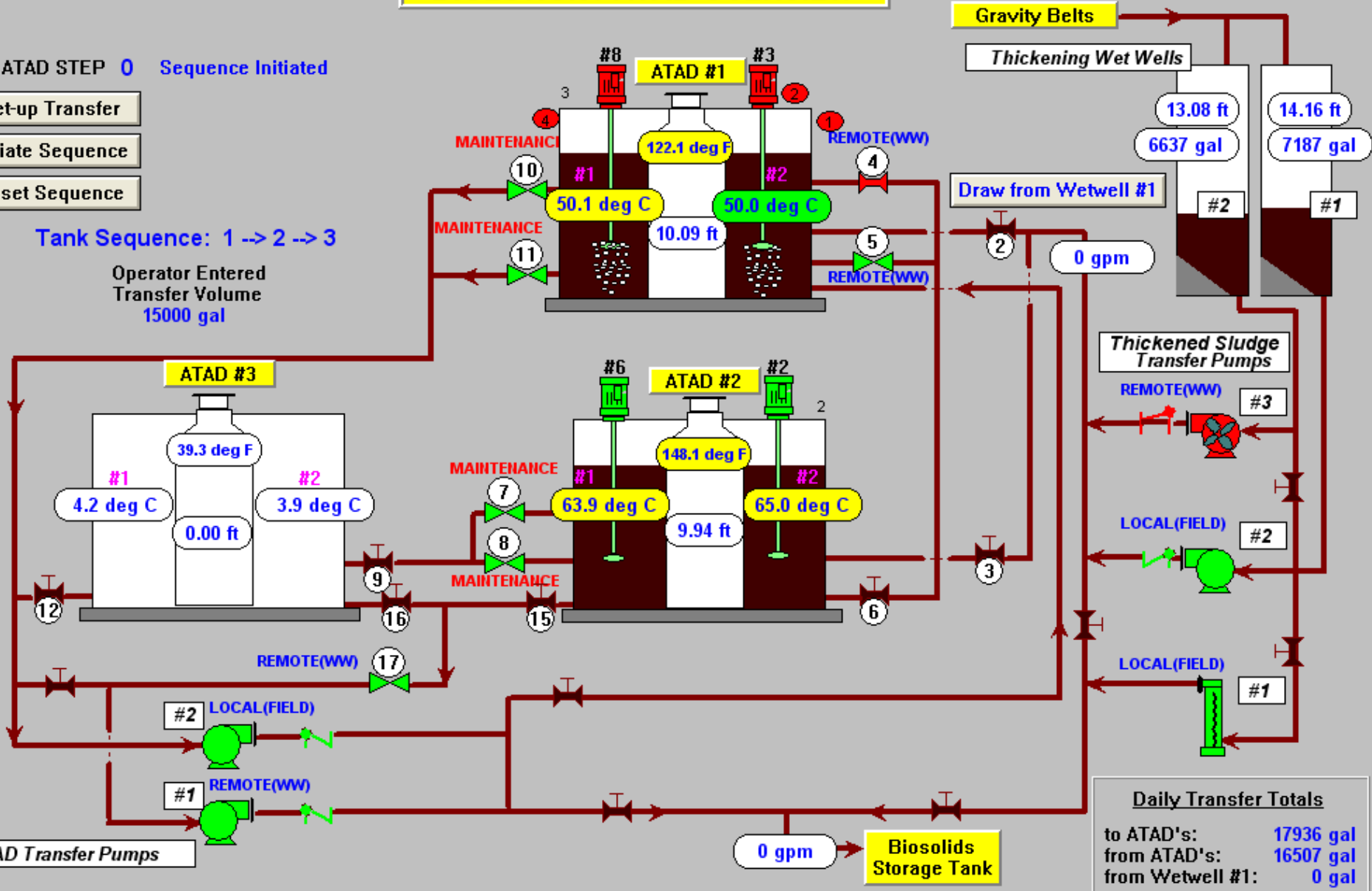
Print Screen

ATAD STEP 0 Sequence Initiated

- Set-up Transfer
- Initiate Sequence
- Reset Sequence

Tank Sequence: 1 --> 2 --> 3

Operator Entered  
Transfer Volume  
15000 gal



Daily Transfer Totals	
to ATAD's:	17936 gal
from ATAD's:	16507 gal
from Wetwell #1:	0 gal

ATAD Transfer Pumps

0 gpm → Biosolids Storage Tank

User Access  
gehring Prgrmr.

City Overview	Overflow Status	Current Alarms	Display Menu	Start Daily Check	S Q I
WRF Overview	Pump Station Status	Alarms / Events	Historical Trends	Daily Totals	

# DIGESTION / ATAD OVERVIEW

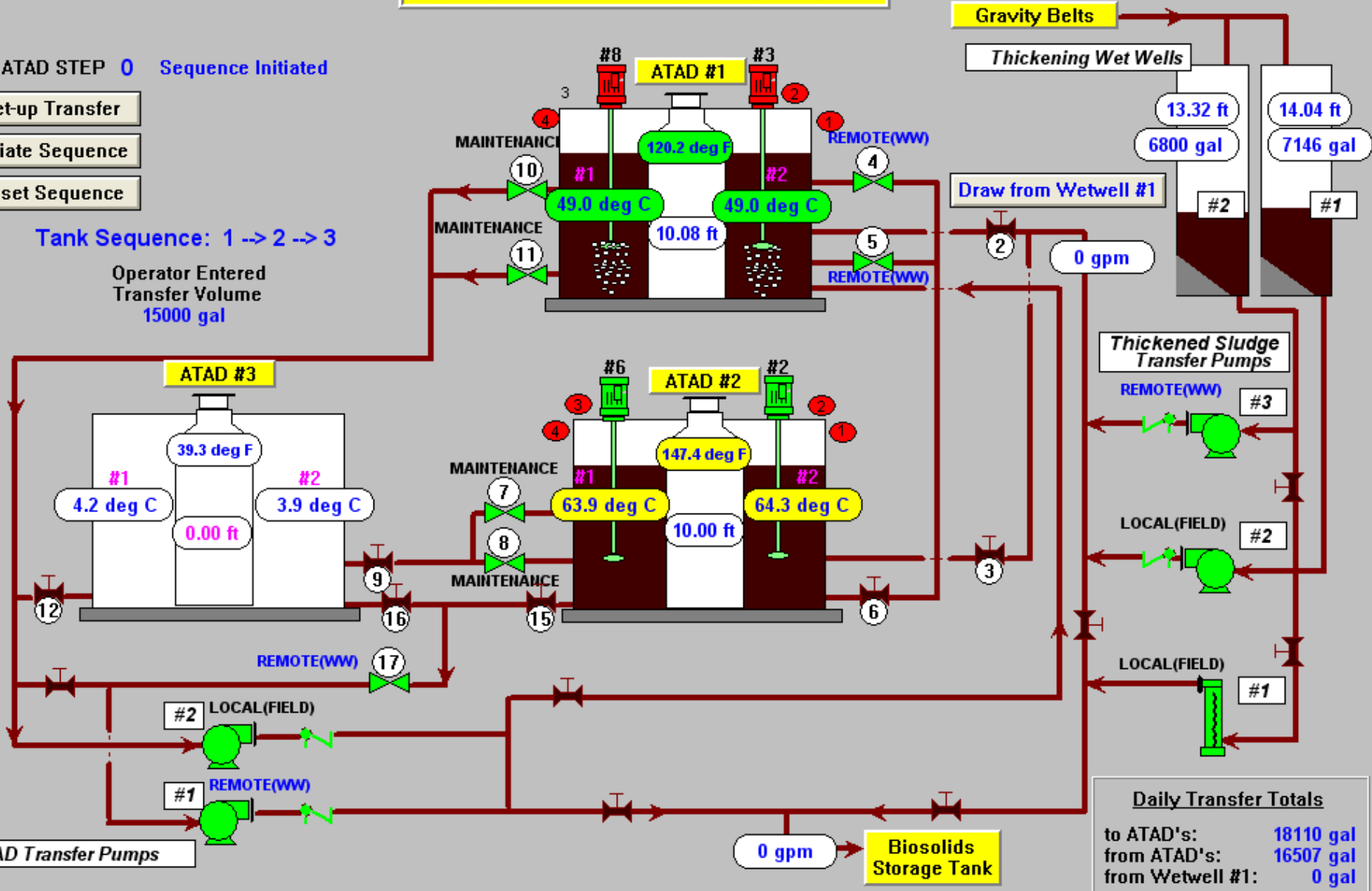
Print Screen

ATAD STEP 0 Sequence Initiated

- Set-up Transfer
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- Reset Sequence

Tank Sequence: 1 --> 2 --> 3

Operator Entered Transfer Volume  
15000 gal



Daily Transfer Totals	
to ATAD's:	18110 gal
from ATAD's:	16507 gal
from Wetwell #1:	0 gal

ATAD Transfer Pumps

0 gpm → Biosolids Storage Tank

User Access  
 gehring Prgrmr.

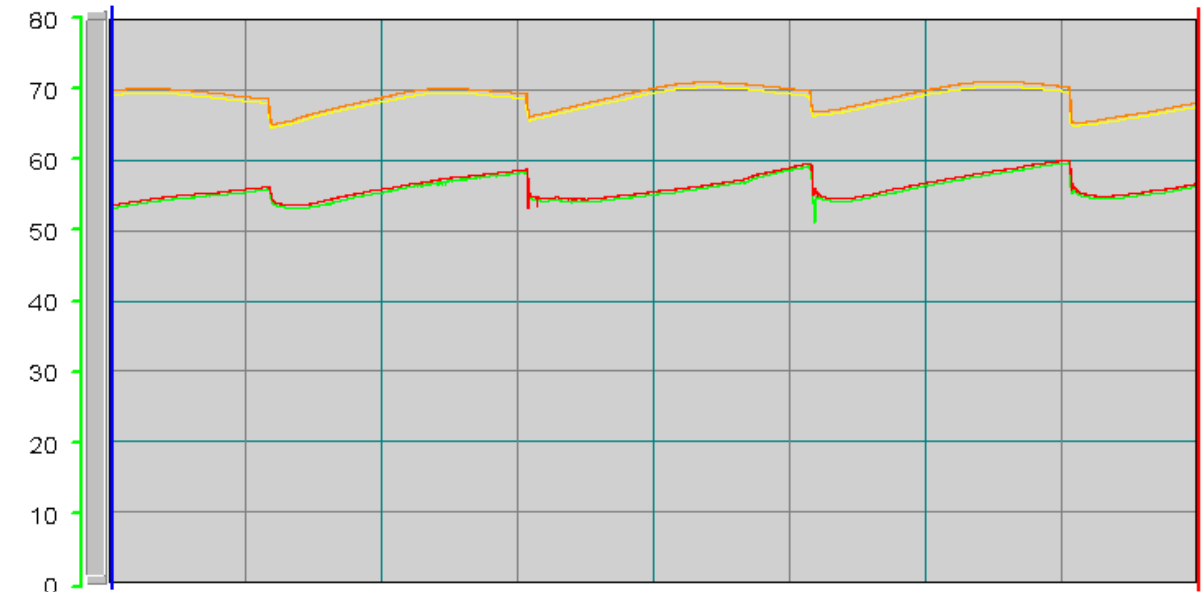
City Overview	Overflow Status	Current Alarms	Display Menu	Start Daily Check
WRF Overview	Pump Station Status	Alarms / Events	Historical Trends	Daily Totals

2/19/2009 12:56:53 PM

# HISTORICAL TRENDING

Print Screen

Feb-05-09 00:00:00      Feb-06-09 00:00:00      Feb-07-09 00:00:00      Feb-08-09 00:00:00      Feb-09-09 00:00:00



TT-72-11-3-1TMP  
53.28      56.40

TT-72-11-3-2TMP  
53.76      56.80

TT-72-12-3-1TMP  
69.44      67.84

TT-72-12-3-2TMP  
70.08      68.40

Unavail      Unavail

Unavail      Unavail

Unavail      Unavail

\$Date  
Unavail      Unavail

- ← ATAD #1 Probe 1
- ← ATAD #1 Probe 2
- ← ATAD #2 Probe 1
- ← ATAD #2 Probe 2

00:00:00

00:00:00

00:00:00      Zoom In      4d      Zoom Out      00:00:00

4 hours      1 hour      100 minutes      30 minutes      10 minutes

Clear Tags

Initialize for Ox Ditch DO Readings

Initialize for Septage Readings

Initialize for ATAD Readings

Save To File      Filename: J:\LOGFILES\OPS32CSV\02182009.CSV



User Access  
**Viewer**

City Overview	Overflow Status	Current Alarms	Display Menu	Start Daily Check	S Q L
WRF Overview	Pump Station Status	Alarms / Events	Historical Trends	Daily Totals	

# ATAD'S

Produce Class A , "Exceptional Quality"  
Biosolids due to achieving pathogen  
reduction and vector attraction reduction  
requirements.



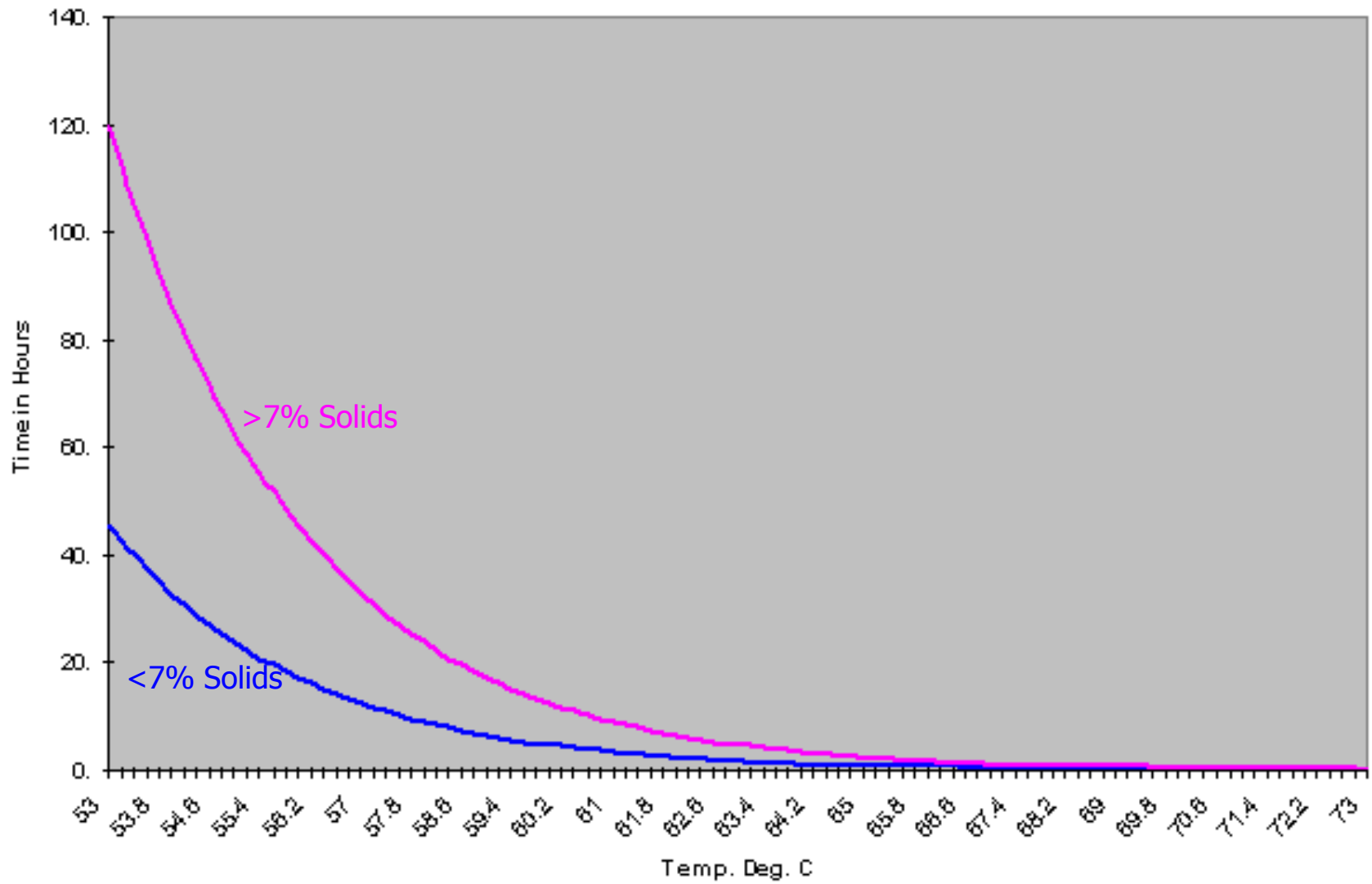
# Pathogen Reduction

Fecal coliform in the Biosolids shall be less than 1000 MPN per gram of total solids dry Weight.

# Vector Attraction Reduction

The mass of volatile solids in the Biosolids shall be reduced by a minimum of 38%.

### EPA Class A Time / Temperature Relation



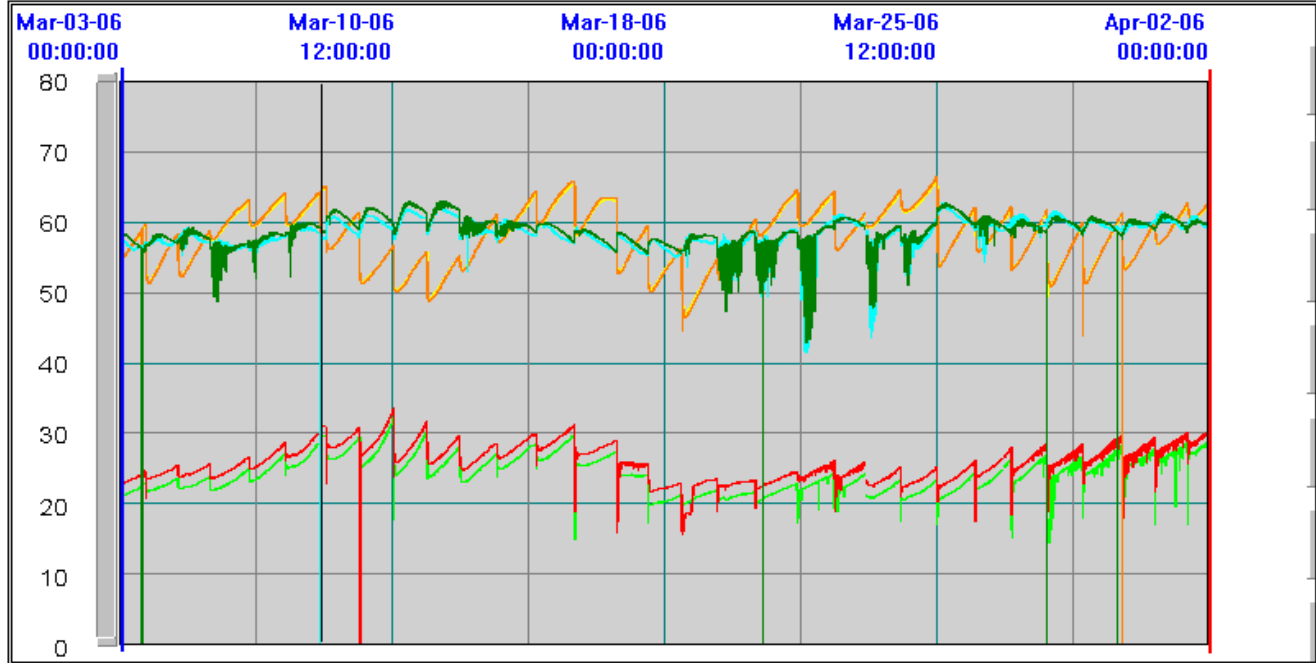
The background is a smooth blue gradient, transitioning from a lighter blue at the top to a darker blue at the bottom. A bright sun flare is visible on the left side, creating a white and yellow glow that fades into the blue. The word "Challenges" is centered in the middle of the image.

# Challenges

3/10/2009 1:43:21 PM

# HISTORICAL TRENDING

Print Screen



TT-72-11-3-1TMP	20.96	28.64
TT-72-11-3-2TMP	22.80	30.08
TT-72-12-3-1TMP	54.83	62.40
TT-72-12-3-2TMP	54.72	62.72
TT-72-13-3-1TMP	57.96	59.36
TT-72-13-3-2TMP	58.88	59.84

- ← ATAD #1 Probe 1
- ← ATAD #1 Probe 2
- ← ATAD #2 Probe 1
- ← ATAD #2 Probe 2
- ← ATAD #3 Probe 1
- ← ATAD #3 Probe 2

00:00:00

00:00:00

Zoom In 30d Zoom Out

4 hours 1 hour 100 minutes 30 minutes 10 minutes

Save To File Filename: J:\LOGFILES\OPS32CSV\03092009.CSV

- Initialize for Ox Ditch DO Readings
- Initialize for Septage Readings
- Initialize for ATAD Readings

	User	Access	City Overview	Overflow Status	Current Alarms	Display Menu	Start Daily Check	S Q L
	gehring	Prgmr.	WRF Overview	Pump Station Status	Alarms / Events	Historical Trends	Daily Totals	





# Precipitation and Grit



# Supplemental Food for Heat Production

## Molasses



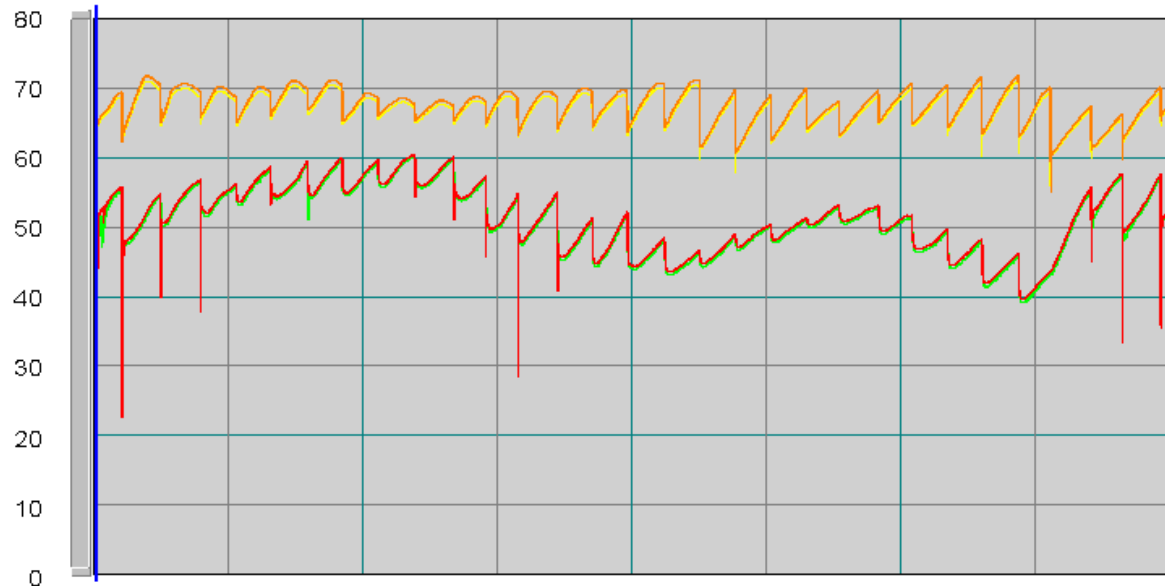


3/10/2009 1:20:12 PM

### HISTORICAL TRENDING

Print Screen

Feb-01-09 14:52:48      Feb-09-09 02:52:48      Feb-16-09 14:52:48      Feb-24-09 02:52:48      Mar-03-09 14:52:48



TT-72-11-3-1TMP	45.90	51.86
TT-72-11-3-2TMP	50.74	52.30
TT-72-12-3-1TMP	64.08	66.84
TT-72-12-3-2TMP	64.35	67.36

- ATAD #1
- Probe 1
- ATAD #1
- Probe 2
- ATAD #2
- Probe 1
- ATAD #2
- Probe 2

14:52:48 [Navigation Buttons]

14:52:48 [Navigation Buttons]

4 hours   1 hour   100 minutes   30 minutes   10 minutes

Zoom In   30d   Zoom Out

Save To File   Filename: J:\LOGFILES\OPS32CSV\03092009.CSV

- Clear Tags
- Initialize for Ox Ditch DO Readings
- Initialize for Septage Readings
- Initialize for ATAD Readings

User Access

gehring Prgrmr.

City Overview	Overflow Status	Current Alarms	Display Menu	Start Daily Check	S Q L
WRF Overview	Pump Station Status	Alarms / Events	Historical Trends	Daily Totals	

# Temperature Verification



# ATAD #1 pH Ranges 6 to 8

## Final ATAD pH Ranges 8 to 9

### ATADS release compounds

- Mercaptans
- Ammonia
- H<sub>2</sub>S
- Dimethyl sulfide
- Dimethyl disulfide



# Biofilter (and some history)



# Biosolids Storage Tank



# Class A Liquid Biosolids Applied to Farmers fields.

2015: 4.02 MG Hauled to over 20 locations in Yamhill County



We try not to stand behind our product

# In case of spill

- Small or Large



# Record Keeping



## Biosolids Application Record

Field #: 16A400L (McRae) Crop: Fescue Rate: 12,000 Gal/Acre Acreage 29.0  
 Notes: Off of Starr Quarry Road 45°09' 28.06"N 123°07' 49.59"W

Date: 7/21/16 Driver: Joe m Company: -

Time	Gallons	Notes
5:47/5:53	5,000	ENTER FIELD FROM Starr Quarry Road
6:54/7:06		9.5 - miles
8:45/8:13		
9:22/9:31		
10:53/11:02		
12:08/12:31		
13:23/13:43		
14:49/14:58		
15:58/16:07		
17:13/17:23		

TOTAL # of loads 10 Total Gallons: 50,000 N↑ Field Plot:





# Dealing With New Neighbors



# **BIOSOLIDS RECYCLING**

Biosolids are the nutrient-rich organic product of wastewater treatment.



**Wastewater Services Division**

3500 NE Clearwater Dr, McMinnville, Oregon 97128  
(503) 434-7313 Fax (503) 434-7438  
[www.mcminnvilleoregon.gov](http://www.mcminnvilleoregon.gov)

- Solids removed from wastewater are processed and stabilized to reduce volume and odor during which disease causing organisms are killed and beneficial microorganisms eat, or digest, organic solids.
- Biosolids are a beneficial resource containing essential plant nutrient and organic matter.
- Biosolids have a distinctive odor that some people may find offensive, and typically last for a few days. The City and farmers work together to minimize the odors and their effects.
- McMinnville produces Class A or “exceptional quality” biosolids that meet all federal and state regulatory requirements.

For more information, contact:  
(503) 434-7313

# Success!



# Storage Tank



QUESTIONS?



30 STONES  
12 FL. OZ. CANS

KEYSTONE  
LIGHT

ALWAYS SMOOTH.