



Renovation Realities of a Lime Softening Treatment Plant



WATERCON 2014

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- 💧 Background Information
- 💧 Existing Water Works System Overview
- 💧 PreRehab LSTP Overview
- 💧 Project Planning
- 💧 Design, Bidding & Contracting
- 💧 Construction
- 💧 Finished Product
- 💧 Lessons Learned
- 💧 Q&A

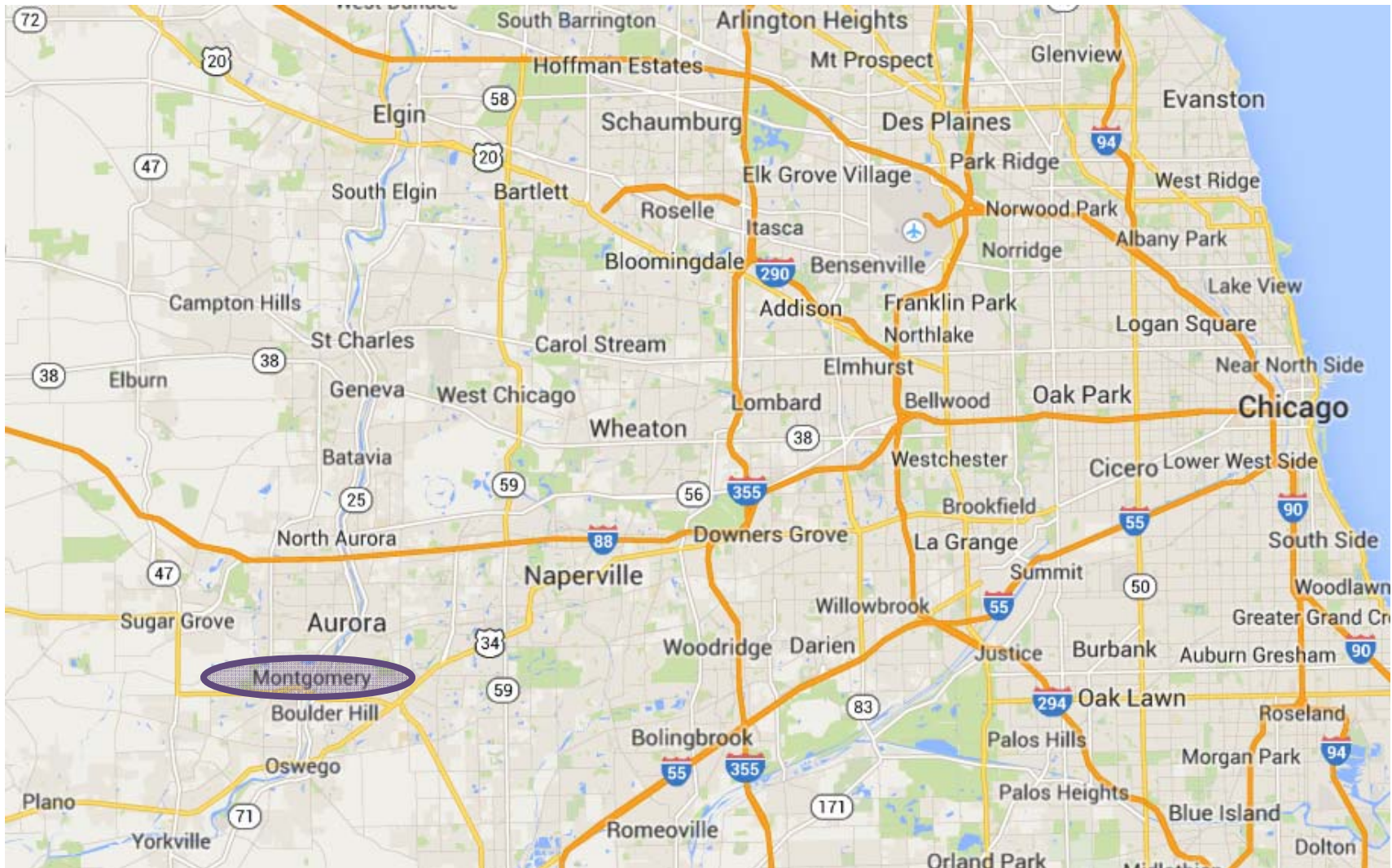
Renovation
Realities





Background Information

Village of Montgomery, Kane Co., IL

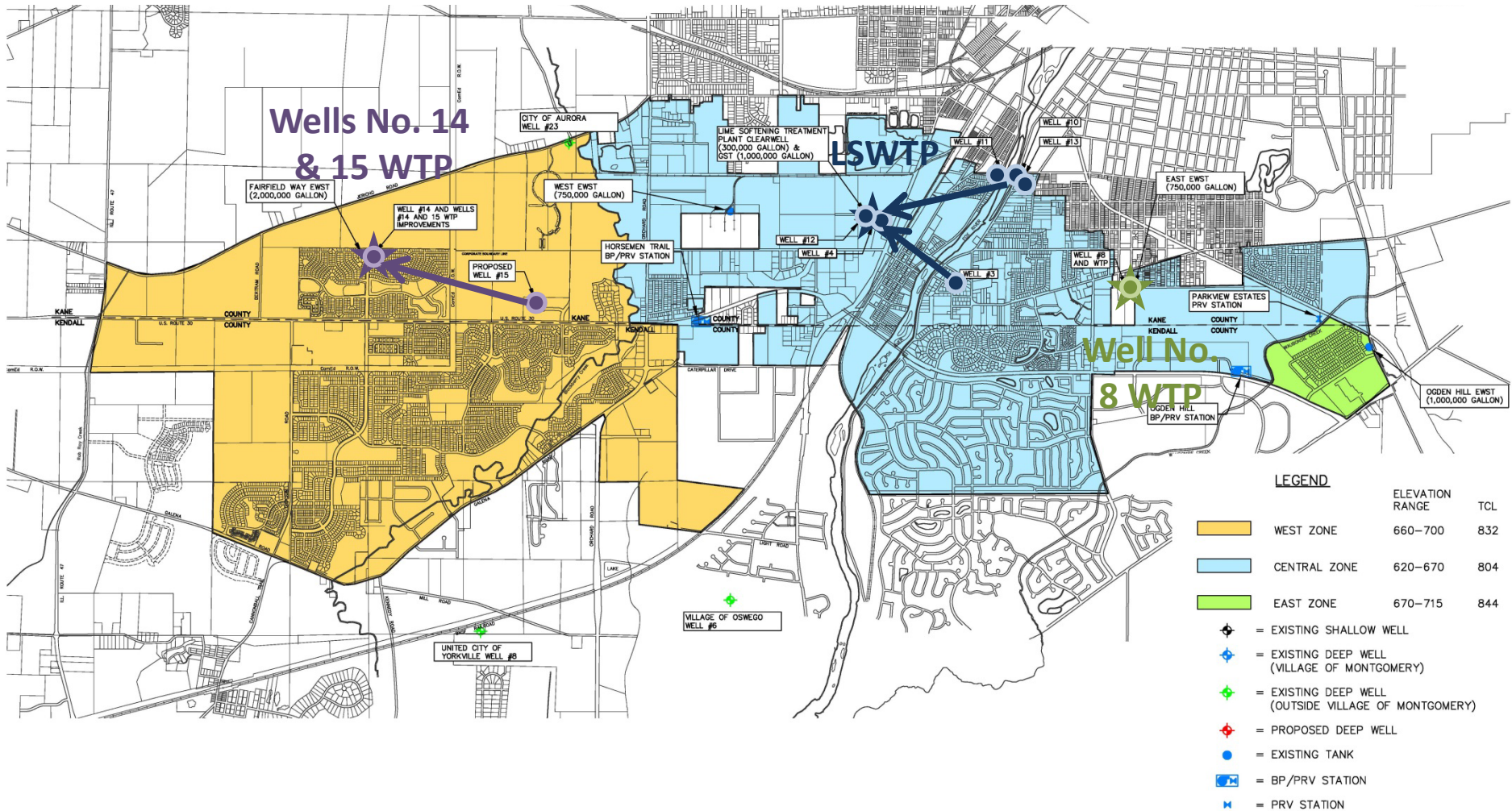


Village Overview

- 💧 Population = 19,089
- 💧 Water Works System Serves
 - Village Residents 19,089
 - Unincorporated Areas 8,399
 - Total: 27,488
- 💧 Water Use
 - Average Day: 2.4 MGD
 - Maximum Day: 3.9 MGD
 - Maximum:Average 1.6



Existing Water Works System



Supply & Treatment Overview

- Wells No. 14 & 15 WTP
 - Tributary Wells: 14 & 15
 - Treatment System: Cation Exchange
 - Capacity: 2.88 MGD
 - Primarily Serves West Pressure Zone



Supply & Treatment Overview

- Wells No. 8 WTP
 - Tributary Wells: 8
 - Treatment System: Cation Exchange
 - Capacity: 1.76 MGD
 - Primarily Serves East & Portions of Central Pressure Zone



Supply & Treatment Overview

- Lime Softening WTP
 - Tributary Wells: 3, 4, 10, 11, 12 & 13
 - Treatment System: Lime Softening
 - Capacity: 5.25 MGD
 - Primarily Serves Most of Central Pressure Zone

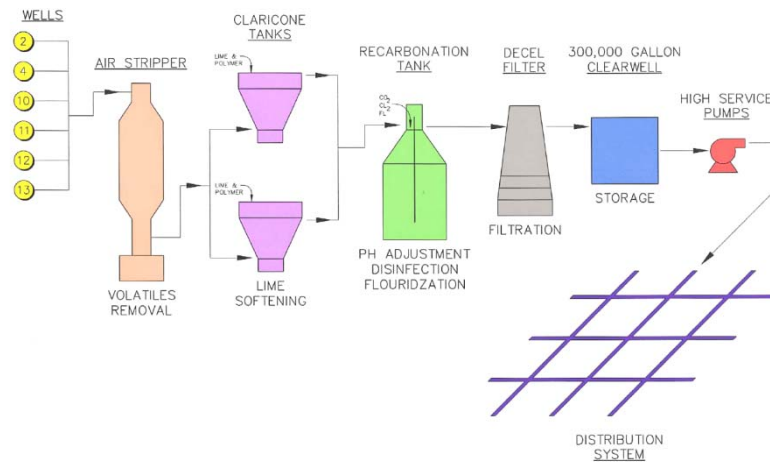
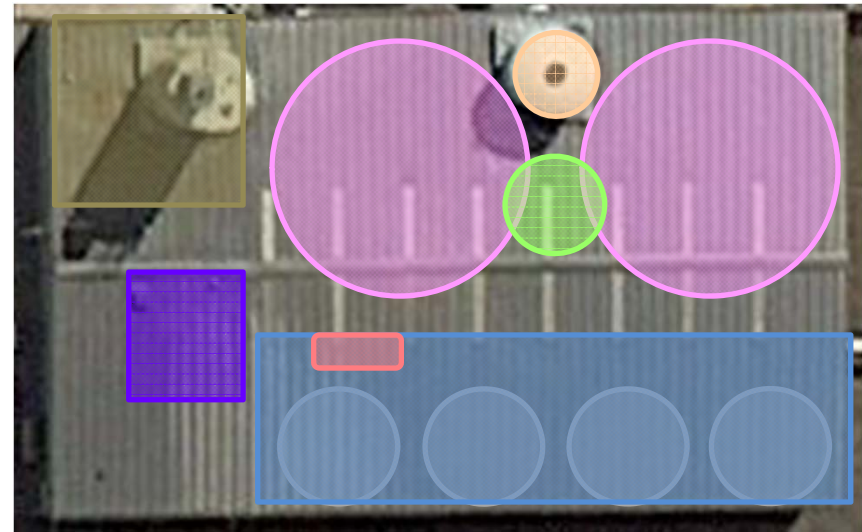
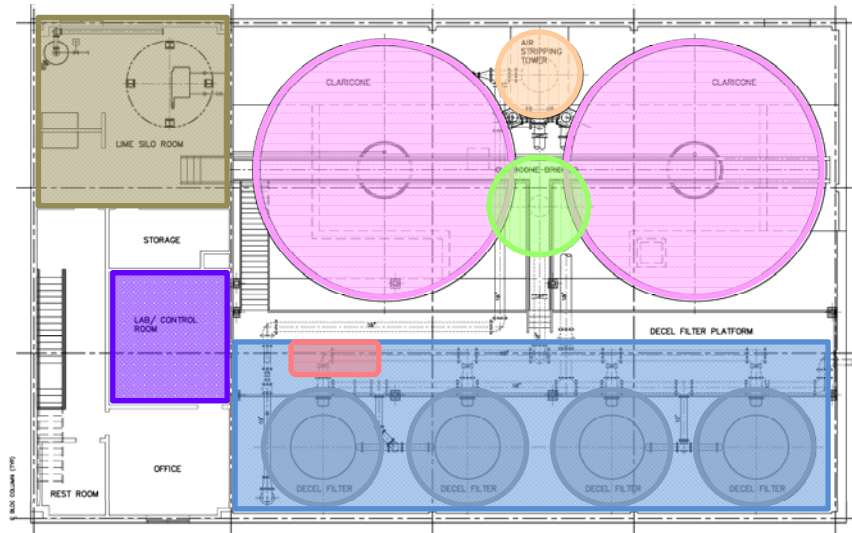


Additional LSTP Background

- Originally Constructed In 1989
- Treatment Objectives
 - Softening
 - Iron Removal
 - Radium & Barium Removal



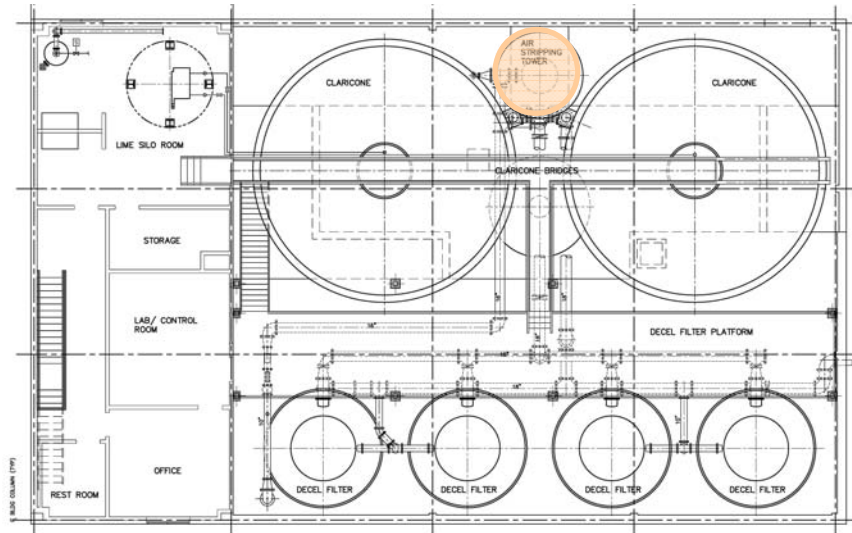
Floor Plan & Process Flow Diagram





PreRehab LSTP Overview

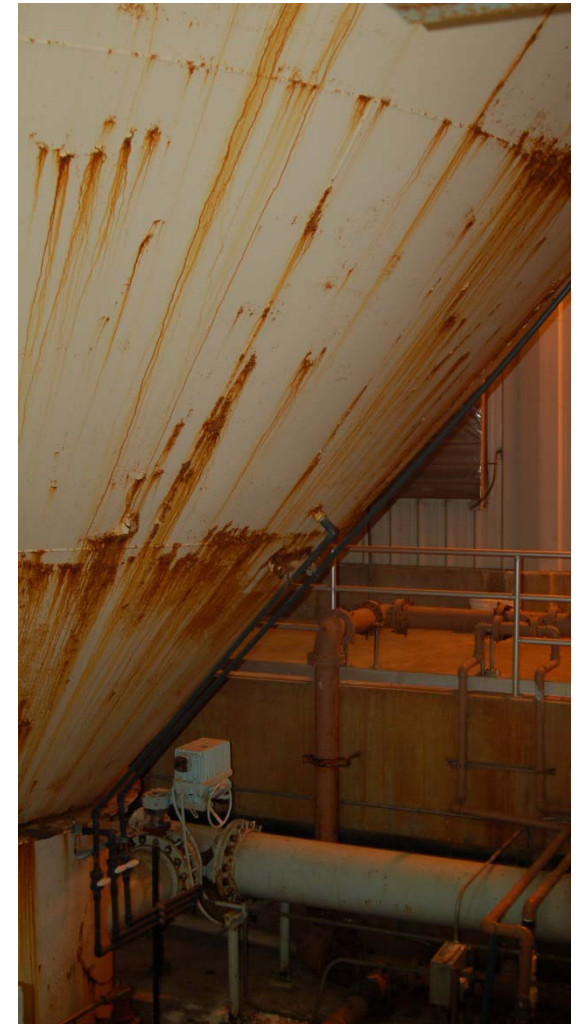
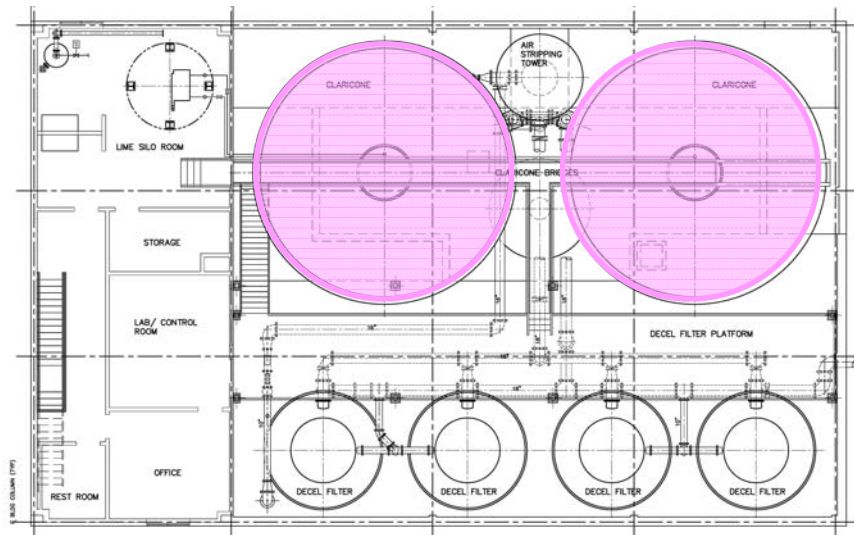
Air Stripper



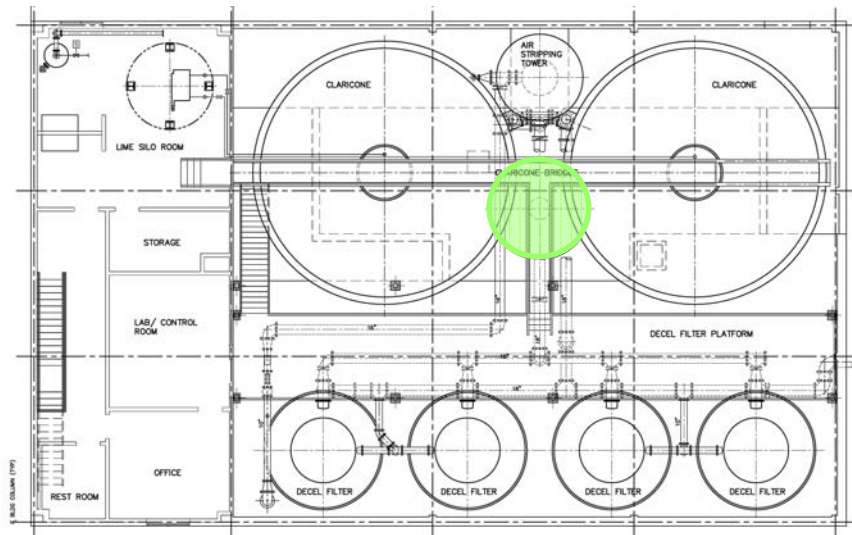


PreRehab LSTP Overview

Claricones



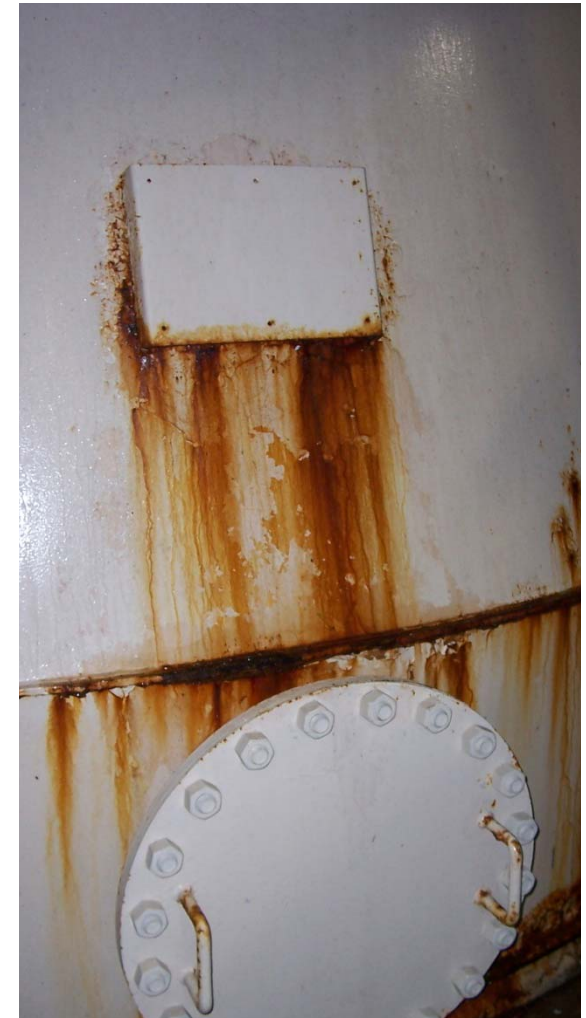
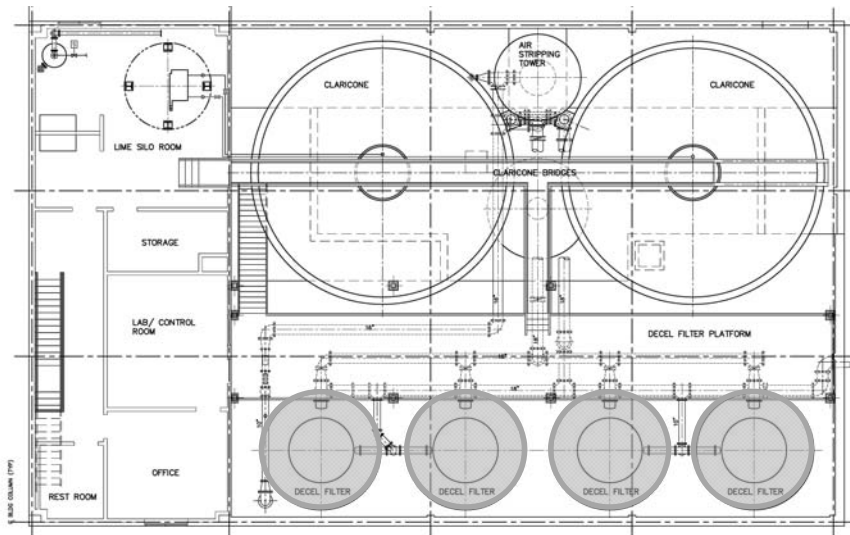
Recarbonation Tank





PreRehab LSTP Overview

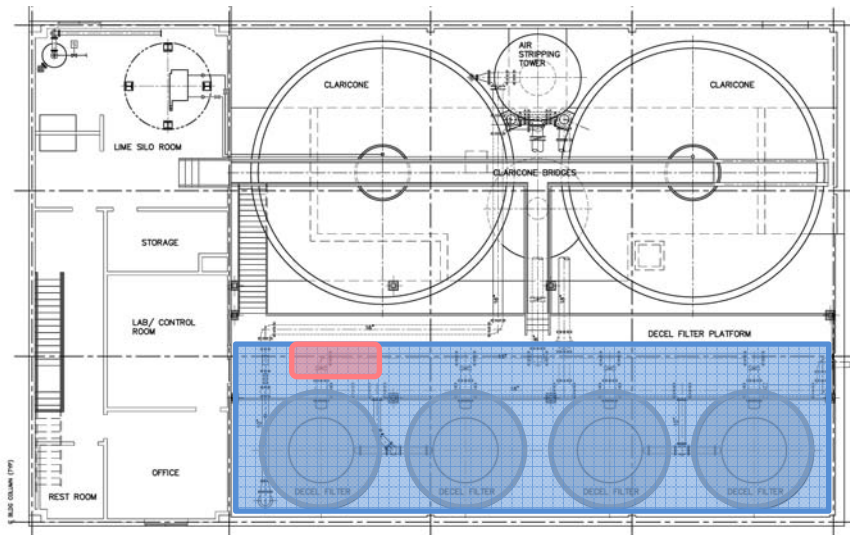
Decel Filters



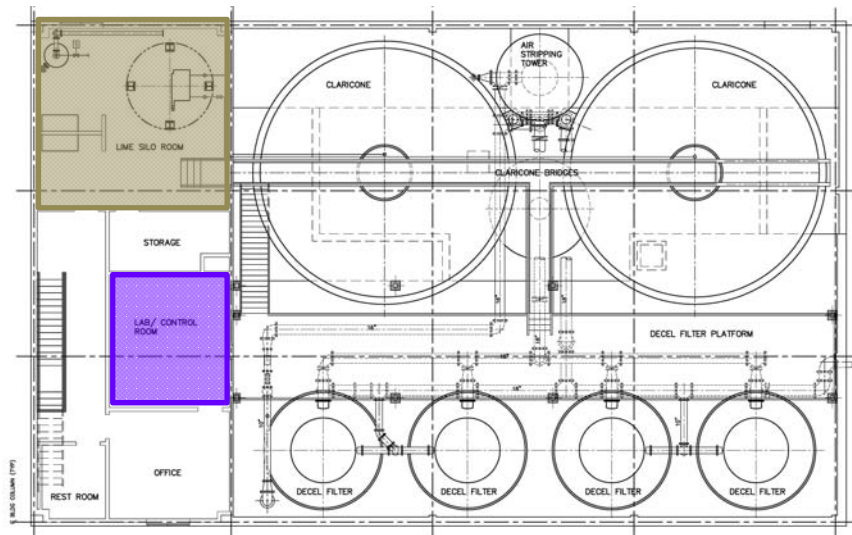


PreRehab LSTP Overview

Clear Well & Pumps



Laboratory & Lime Room





Project Planning

Project Planning Overall Timeline

Field
Reconnaissance &
Implementation
Plan Complete
(July 2006)



Project Plan
Approval
(December
2010)

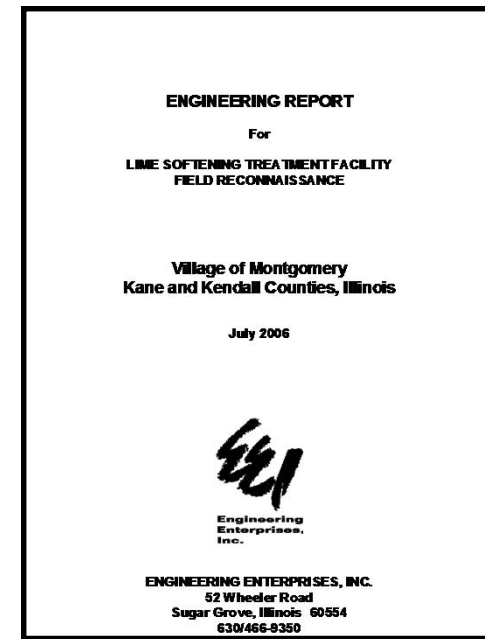


Project Planning

Initial Planning
Report Complete
(7/06)



- Assessed Condition of Entire Facility
- Defined Action Plan For Rehabilitation
- Defined Budgetary Cost Estimate
- Defined Phasing/ Implementation Plan



Initial Planning
Report Complete
(7/06)



Filter Rehab
Initiation
(9/08)

- Phase 1 – Filter Rehabilitation Contract Document Development Initiated



Initial Planning
Report Complete
(7/06)

ARRA
Announced
(2/09)

Filter Rehab
Initiation
(9/08)

- American Recovery and Reinvestment Act (ARRA) of 2009 Announced
- Water Funding Administered Through IEPA Loan Program
 - Principal Forgiveness Opportunity
 - Project Plan Required For Eligibility Consideration





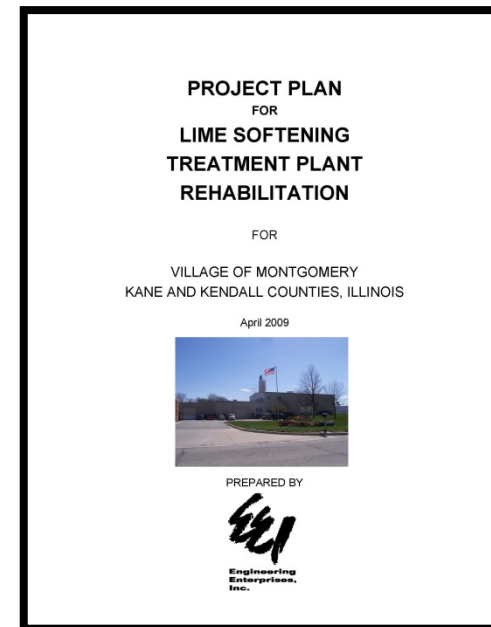
Project Planning

Initial Planning
Report Complete
(7/06)

ARRA
Announced
(2/09)



- Project Plan Development & Submittal To IEPA Infrastructure & Financial Assistance Section (IFAS)



Initial Planning
Report Complete
(7/06)

ARRA
Announced
(2/09)

ARRA Ineligible
Letter
(7/09)



💧 IFAS ARRA Submittal Backlog

- \$4.7 B In Project Submittals → \$0.26 B of Funds Available
- 500 Planning Documents Submitted → Reviewing First 250
- Not One of First 250



Initial Planning
Report Complete
(7/06)

ARRA
Announced
(2/09)

ARRA Ineligible
Letter
(7/09)

Project Plan
Approval
(12/10)



- 💧 Project Plan Reviewed After ARRA Onslaught Worked Through
- 💧 Categorical Exclusion Granted
- 💧 Project Plan Approval



Well No. 8 Challenges

Initial Planning
Report Complete
(7/06)



ARRA
Announced
(2/09)

ARRA Ineligible
Letter
(7/09)

Project Plan
Approval
(12/10)



Filter Rehab
Initiation
(9/08)

Project Plan
Subm.
(4/09)

IEPA PP Review
Comments/
Design
Reinit. (10/10)



Well 8
Failure
(11/09)

Well 8
Trips
(8/10)



TBC

Well 8 Pump &
Electr. Install.
(7/10)



Design, Bidding & Contracting

Project Design Overall Timeline

Design
Reinitiation
(October 2010)



Notice To
Proceed
(October
2011)

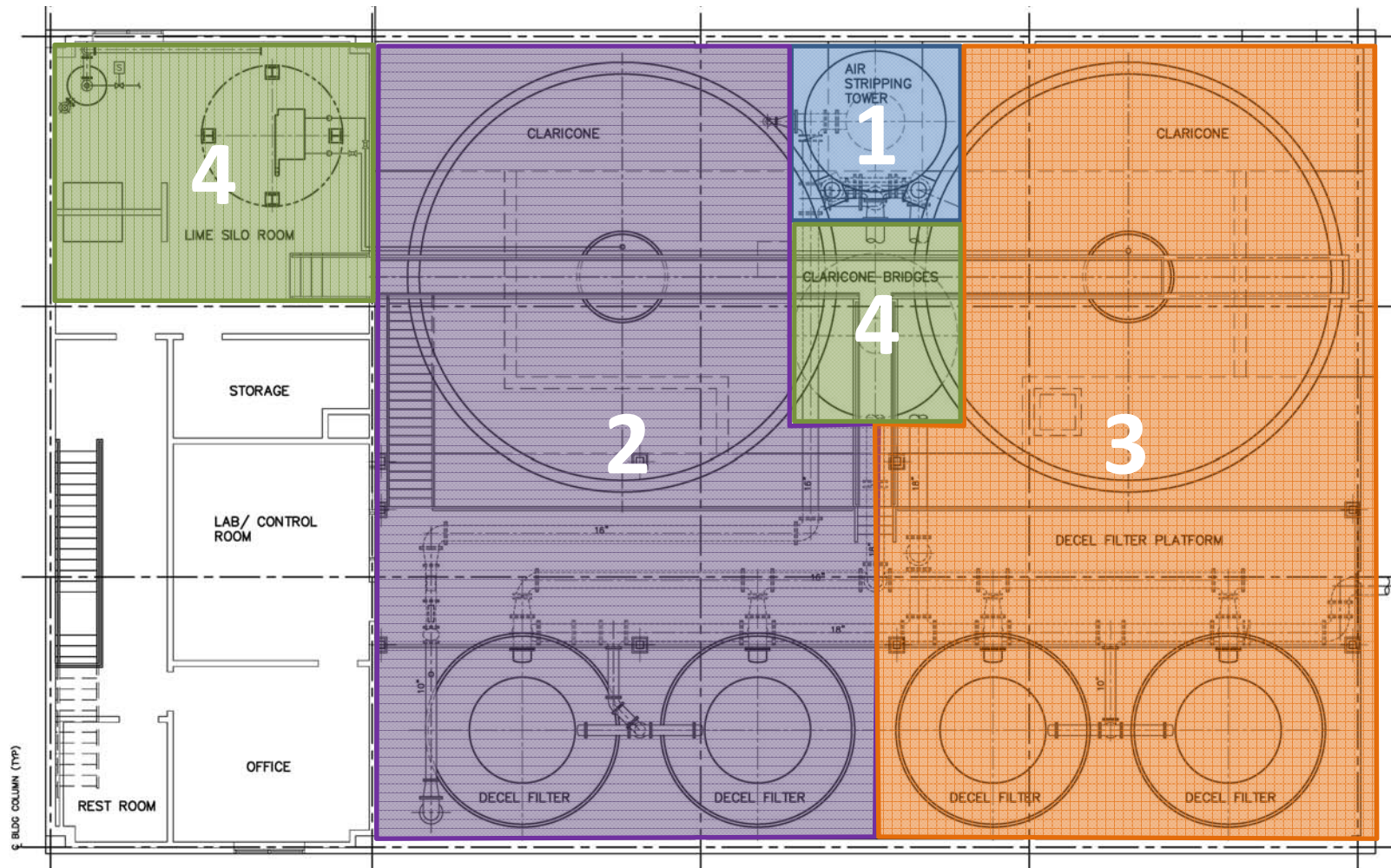


Design, Bidding & Contracting

Design Considerations Overview

- Humidity Management
- Coating System Review
- O&M Improvements
 - Air Stripper Media Replacement
 - Claricone Weir Replacement & Manway Addition
 - Recarbonation Tank Diffuser Replacement
 - Filter Media and Underdrain System Replacement
 - Rebuild Backwash & High Service Pumps

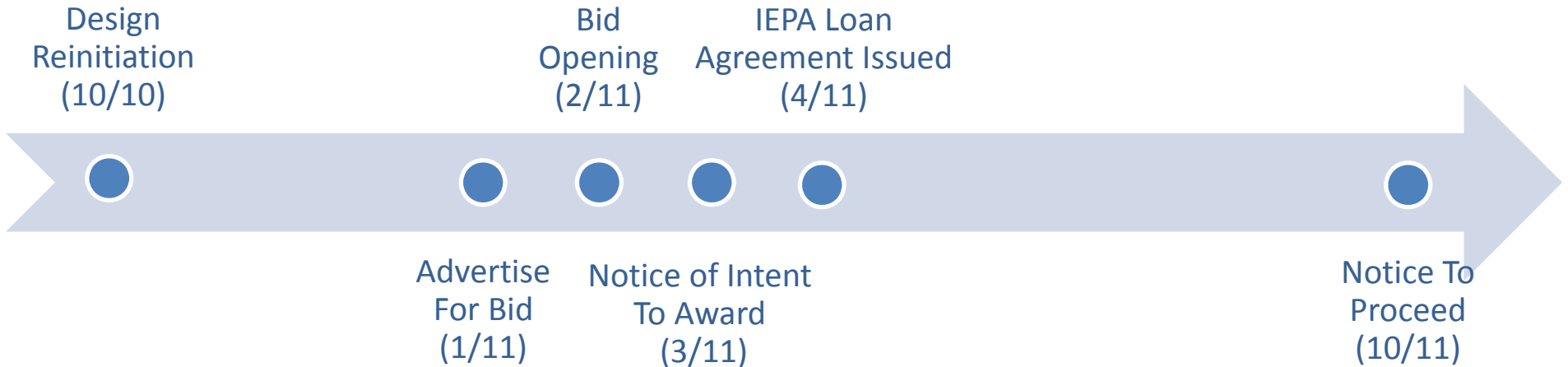
Project Phasing Plan



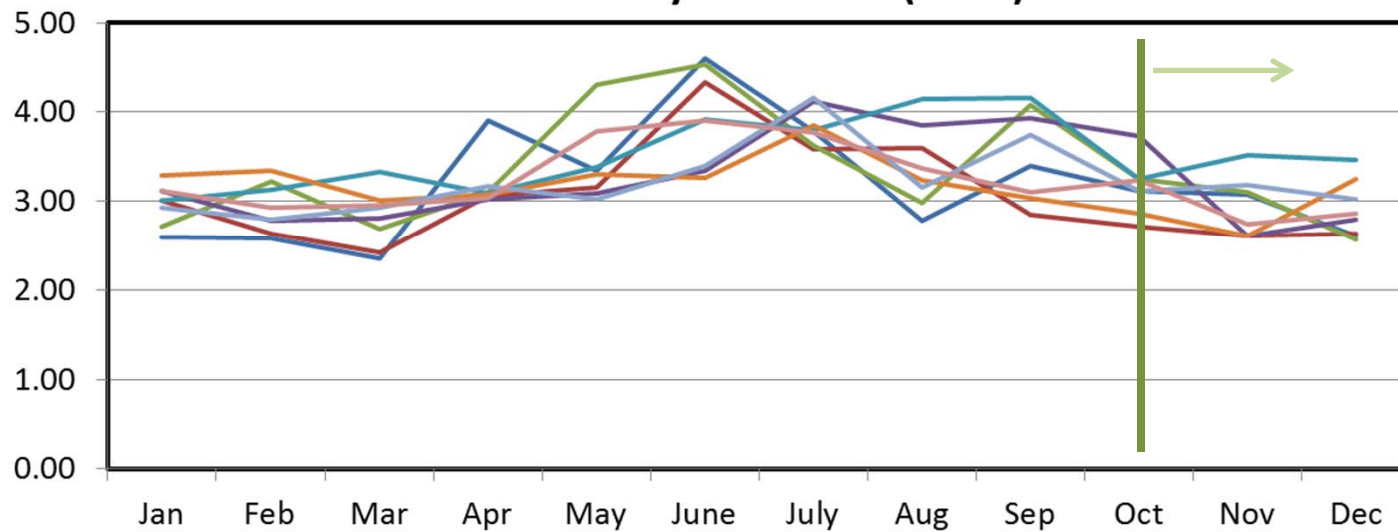


Design, Bidding & Contracting

Design Timeline



Maximum Day Water Use (MGD)





Design, Bidding & Contracting

Design
Reinitiation
(10/10)



Bid
Opening
(2/11)



Well 8
Trips
(8/10)

Well 8 Electr.
Startup
(12/10)

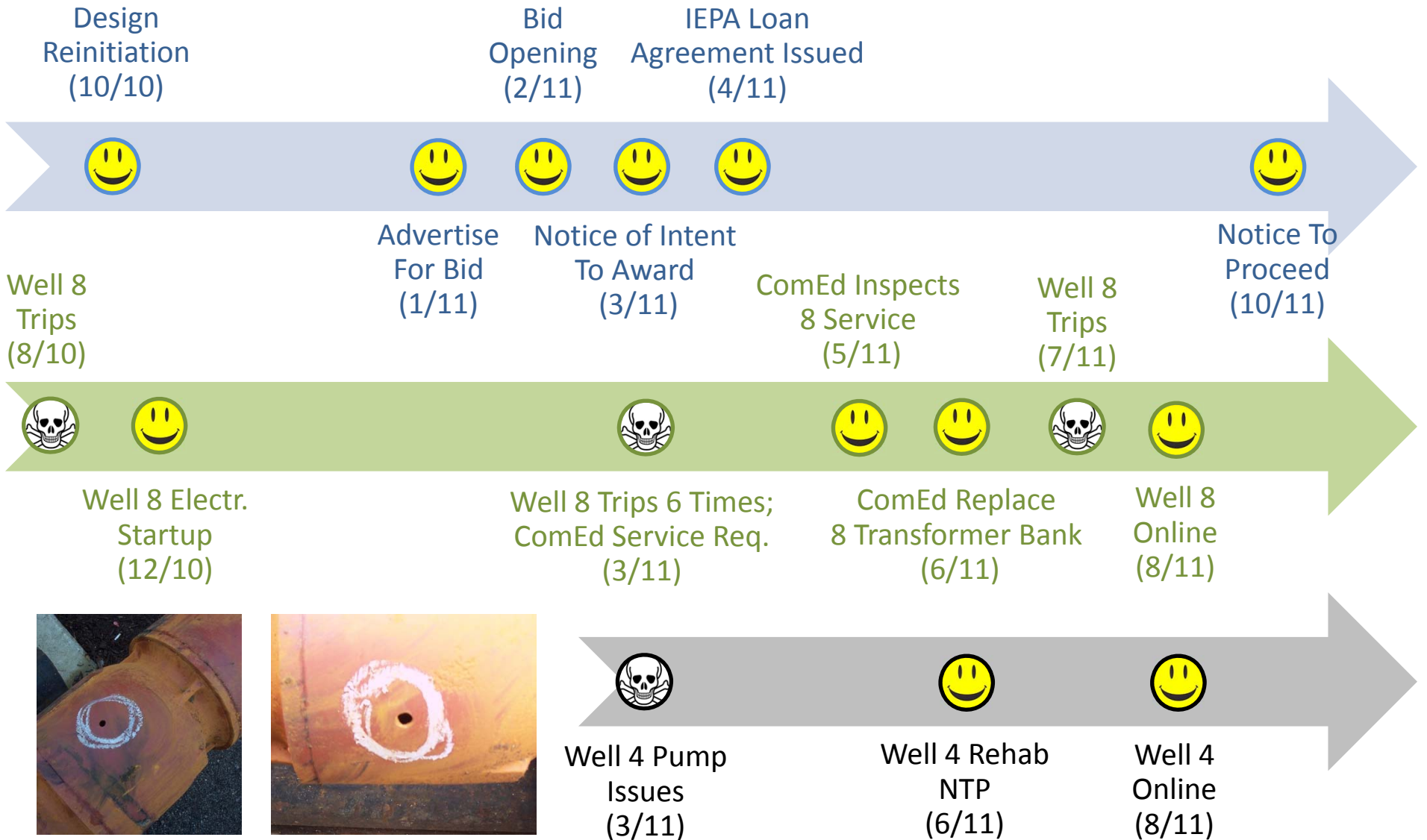
Advertise
For Bid
(1/11)

Notice of Intent
To Award
(3/11)





Design, Bidding & Contracting





Construction

Project Construction Overall Timeline

Notice To Proceed
(October 1, 2011)



LSTP Online
(March 16, 2012)

NTP
(10/1/11)

Contractor
Mobilization
(11/1/11)



Well 15
Drill Compl.
(8/24/11)

Media Ball
Repl. Init.
(11/16/11)



NTP
(10/1/11)

Contractor
Mobilization
(11/1/11)



Well 15
Drill Compl.
(8/24/11)

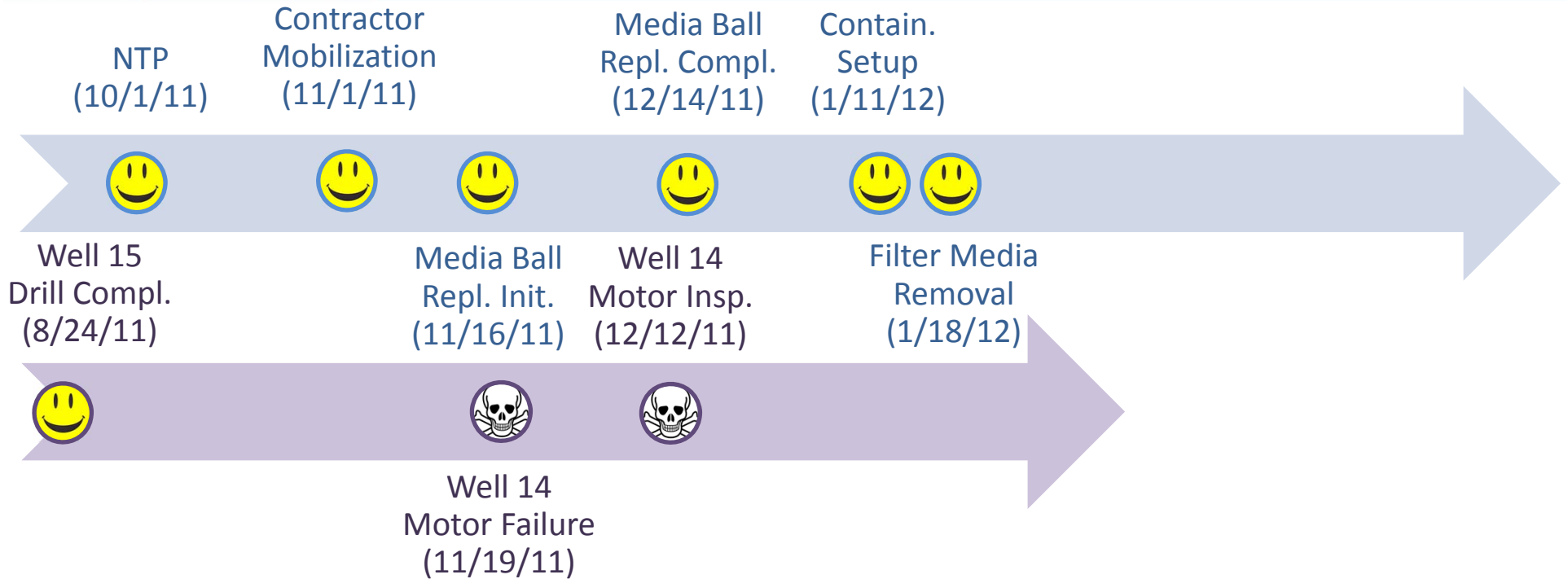
Media Ball
Repl. Init.
(11/16/11)

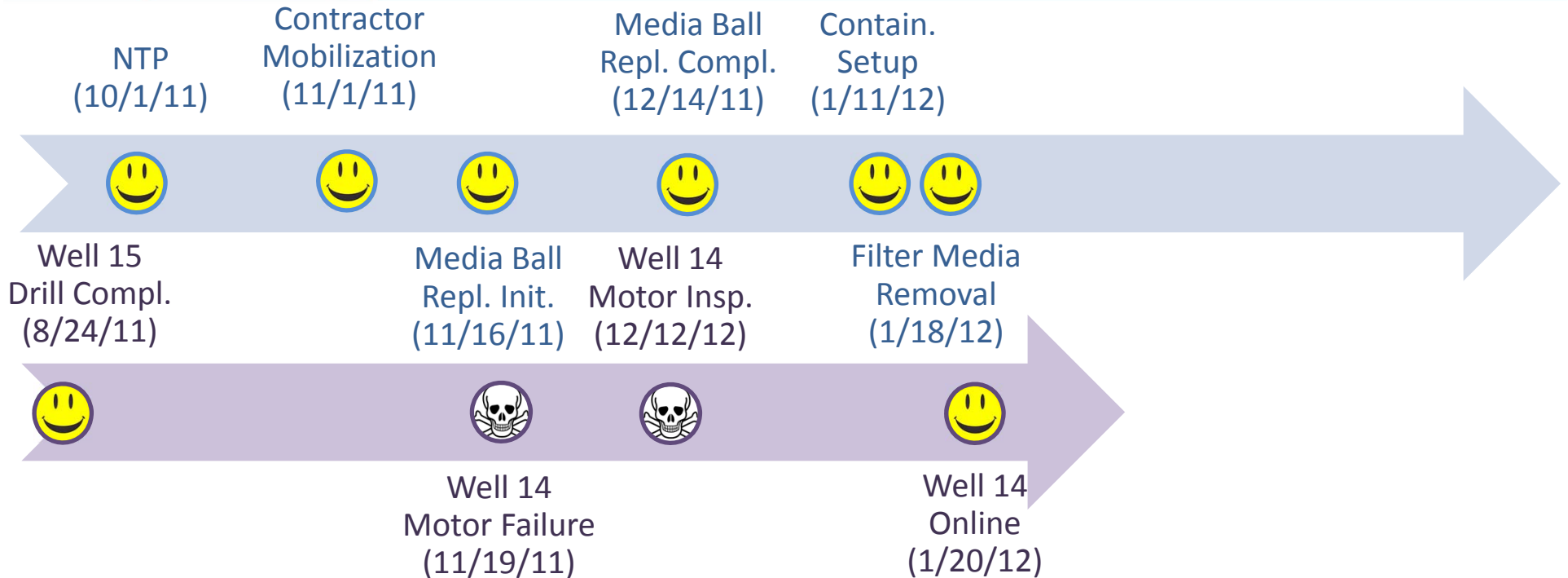
Well 14
Motor Insp.
(12/12/11)

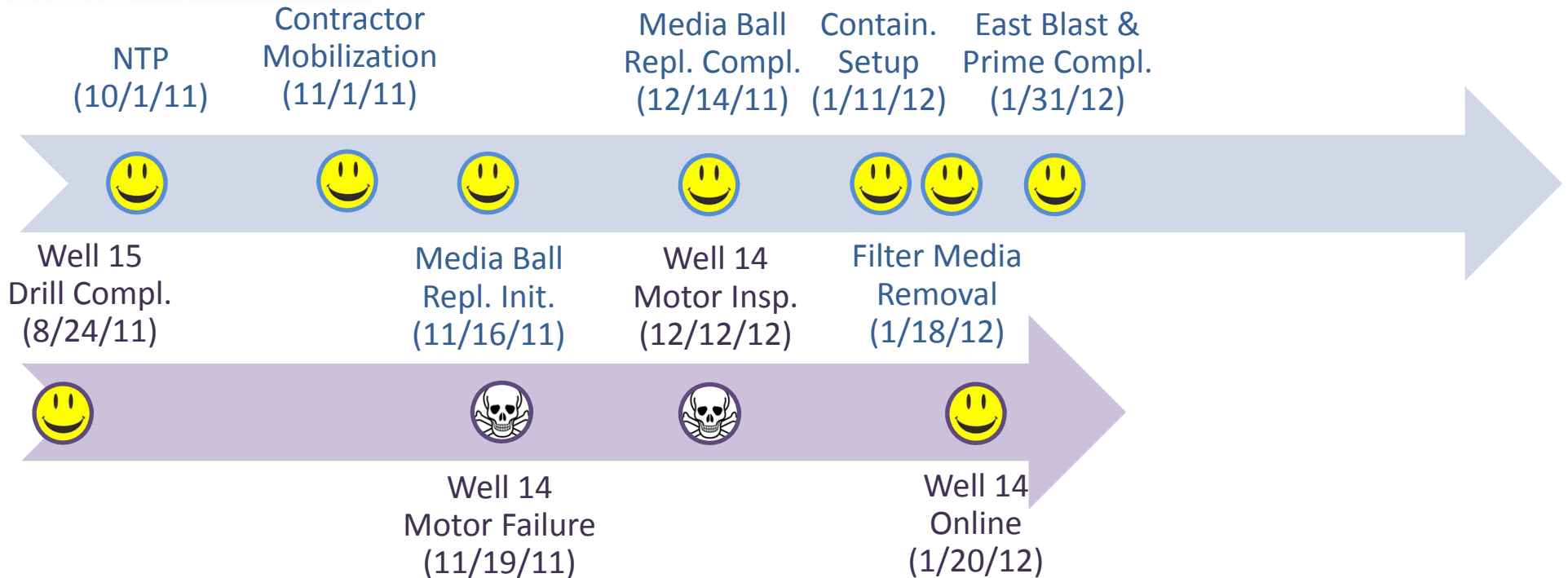


Well 14
Motor Failure
(11/19/11)



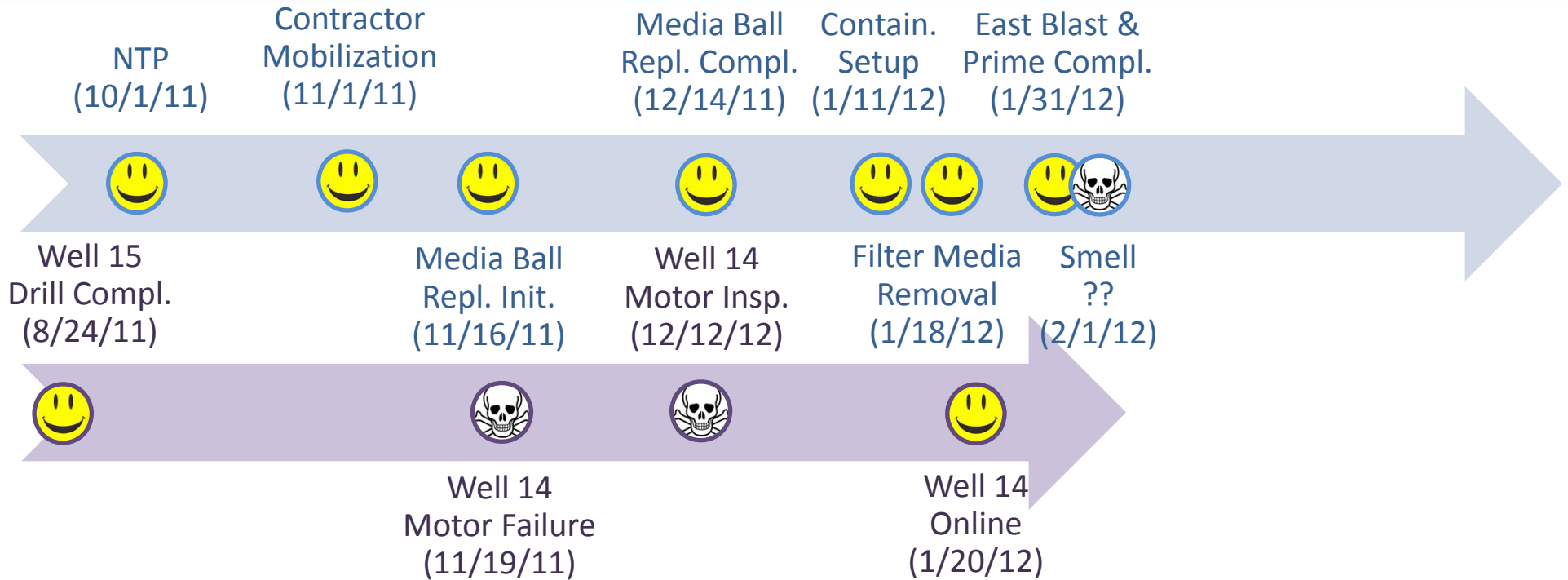








Construction



What's That Smell??

- Containment
 - LSTP Taken Offline
 - Central Pressure Zone WSTs Flushed
- Problem Evaluation → VOC Testing In Distribution System
- Notification → Worked With IEPA Regional Office



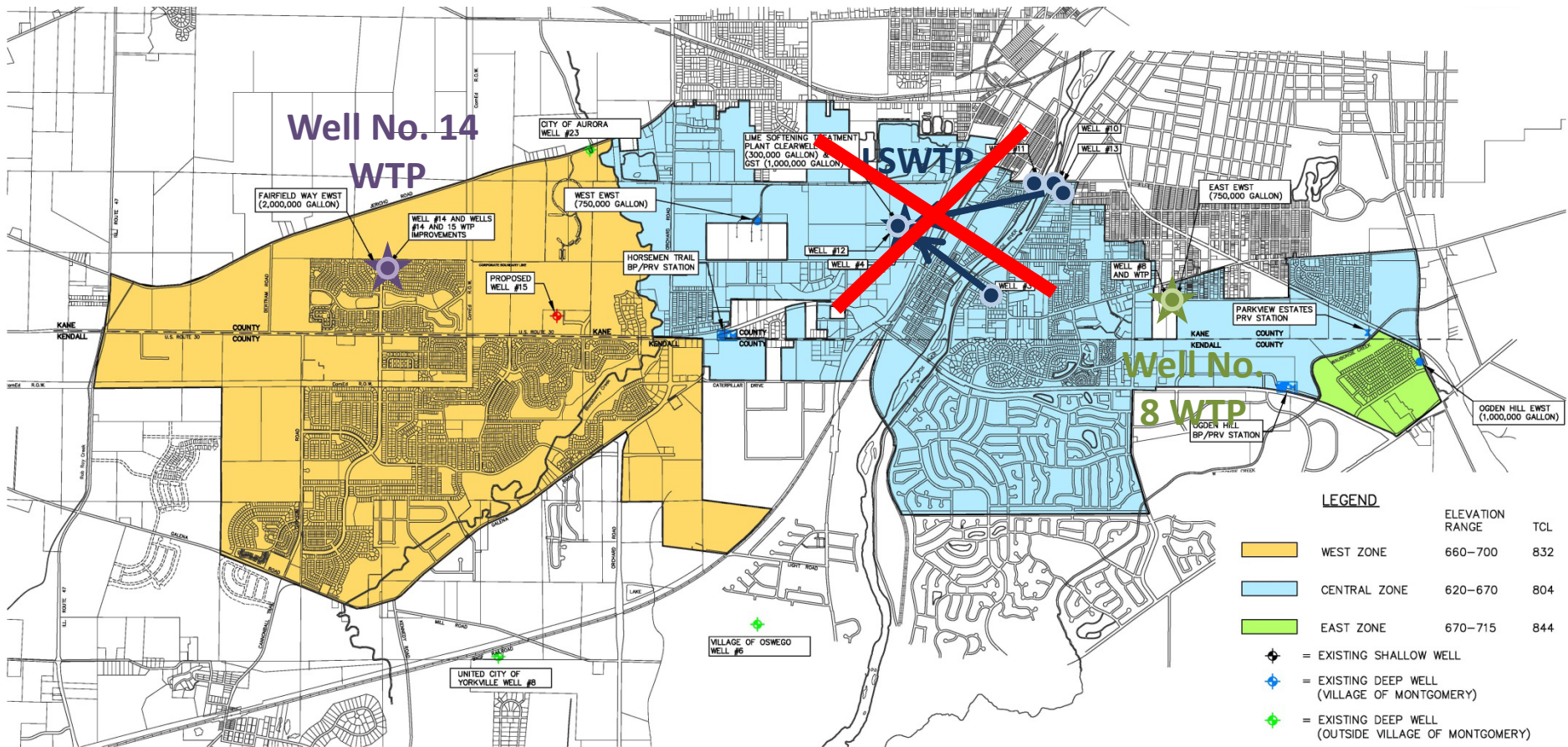
Detected Compounds (mg/l)

Max Level

Detected On

<u>Compound</u>	<u>MCL</u>	<u>2/1/12</u>	<u>2/3/12</u>
Ethylbenzene	700	3.79	ND
Total Xylenes	10,000	24.5	0.51

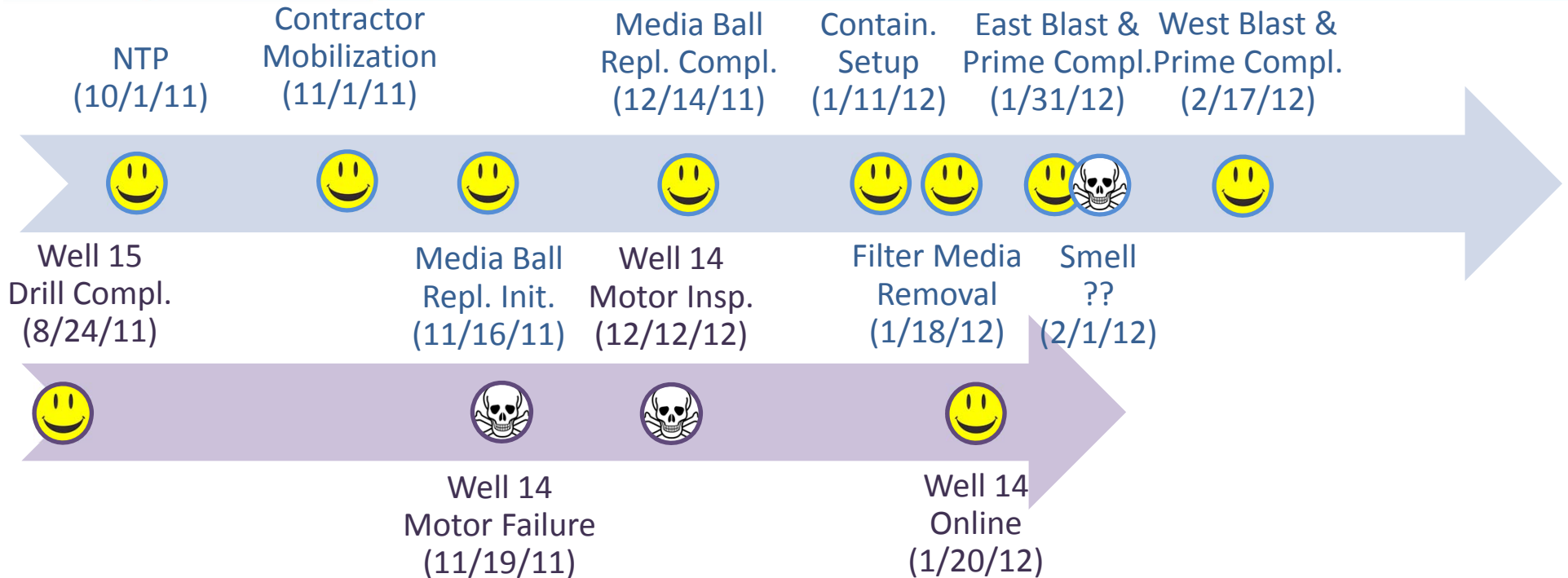
WWS Supply & Treatment Capacity

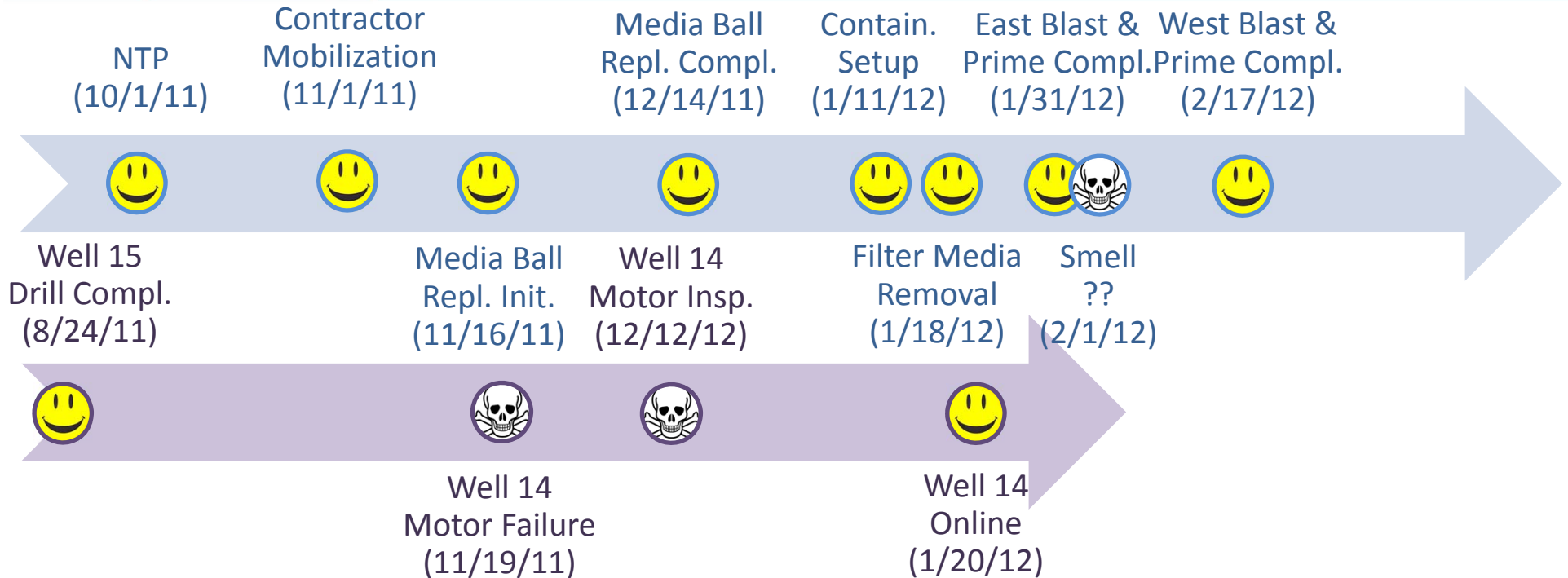


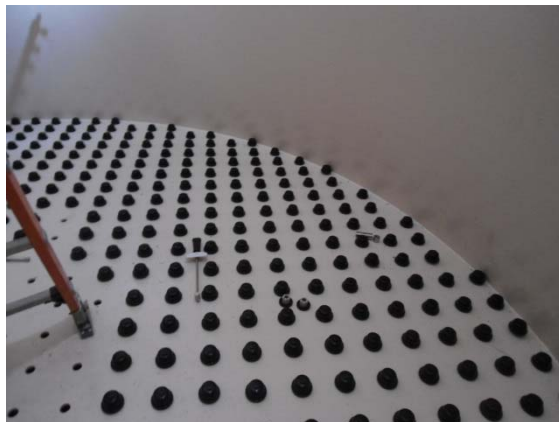
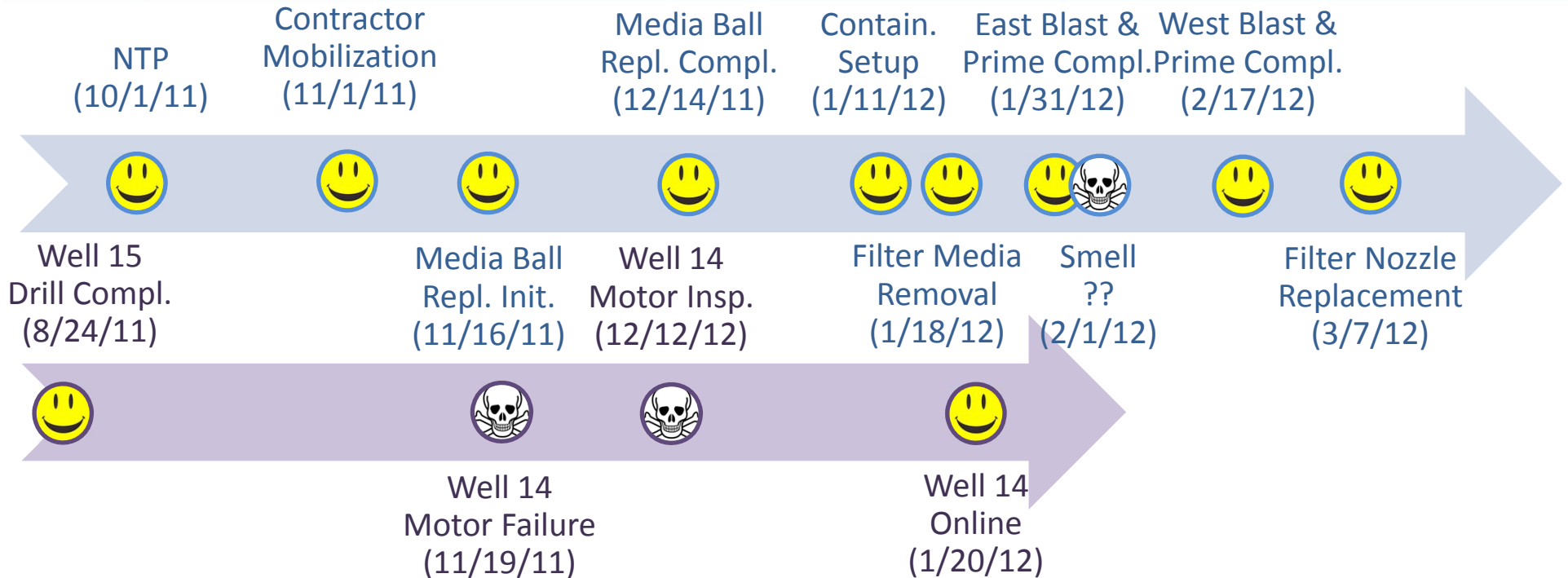
LEGEND

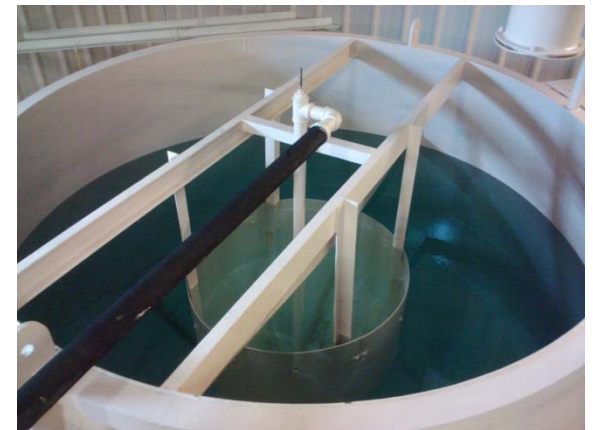
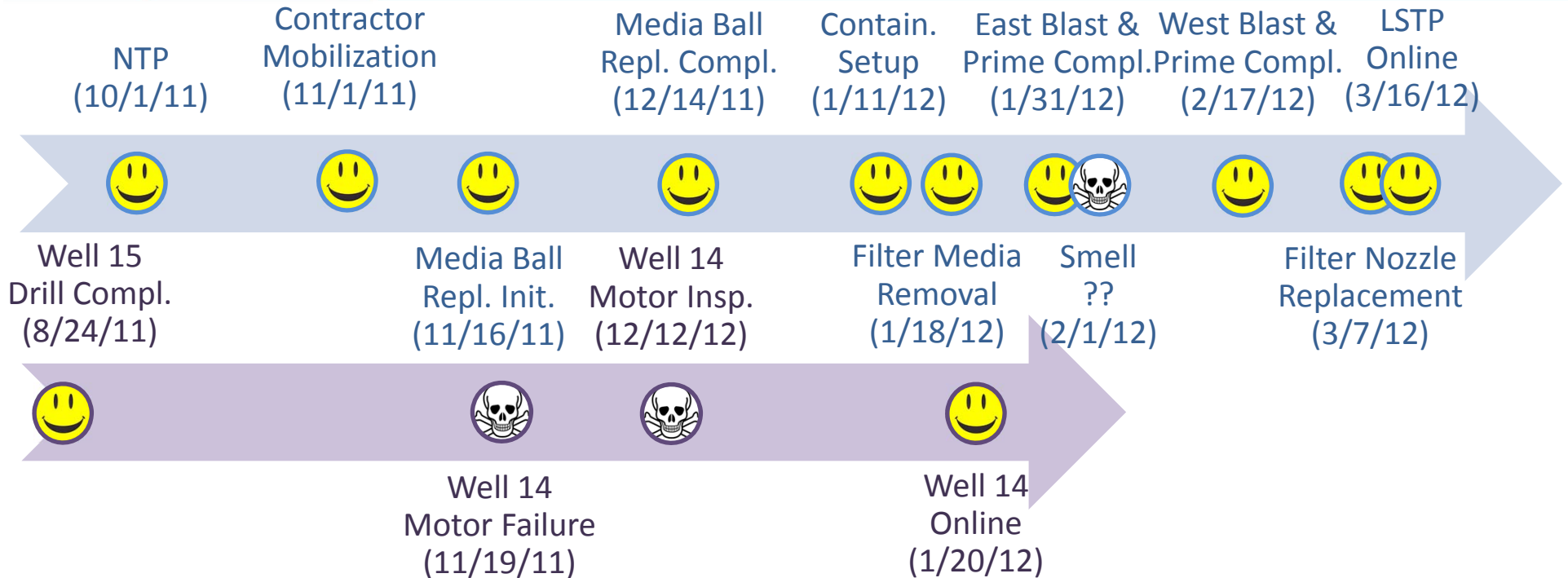
	ELEVATION RANGE	TCL
	WEST ZONE	660-700 832
	CENTRAL ZONE	620-670 804
	EAST ZONE	670-715 844
	= EXISTING SHALLOW WELL	
	= EXISTING DEEP WELL (VILLAGE OF MONTGOMERY)	
	= EXISTING DEEP WELL (OUTSIDE VILLAGE OF MONTGOMERY)	
	= PROPOSED DEEP WELL	
	= EXISTING TANK	
	= BP/PRV STATION	
	= PRV STATION	

Maximum Supply & Treatment Capacity: 3.20 MGD
 Average Day Water Demand: 2.40 MGD
 Maximum Day Water Demand (Summer): 3.90 MGD









Startup Process

- 💧 Verified Everything In Correct Position (i.e. Valves)
- 💧 Confirm Everything Working (i.e. Mixers)
- 💧 Chemical Startup (i.e. Lime Slurry, Poly, etc.)
- 💧 Start Wells
- 💧 Form Lime Blanket
- 💧 Bring Online Remaining Treatment Processes
- 💧 Send Water To Distribution System! 😊

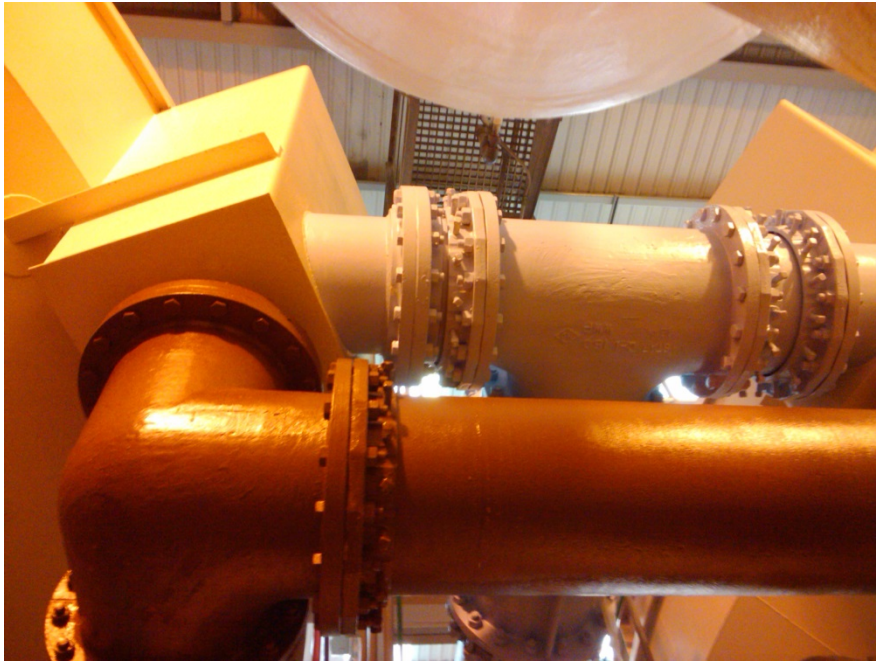


Finished Product





Finished Product





Finished Product





Finished Product





Finished Product



- Weekly Status Meetings/Communication With Team
- Be Prepared For the Unexpected (Response To VOCs)
- Keep Timely and Accurate Documentation
- Maintain Positive Teamwork – Staff, Contractor & IEPA
- Be Aware Of Possible Operational Changes (Water Quality)

Renovation
Realities

- 💧 Shstuff Happens
- 💧 Robust System Gives Operators Tools To Work Through Challenges
- 💧 Maintain Site Access
- 💧 Think Through the Startup Process
- 💧 Think About Contingency Plans

Renovation
Realities

- Expanded Contingency Planning
- Table-Top Your Disasters
- Communications – Board, Media and Public
- Don't Hesitate To Take Action
- Great Opportunity For Staff Input

Renovation
Realities

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