The Future of Wastewater Treatment in Louisville – Part 2

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Morris Forman WQTC

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Morris Forman WQTC

- Largest Treatment Center in Kentucky
- Designed dry weather flow 120 MGD
- Peak Capacity wet weather flow 350 MGD
- Liquid Treatment consists of:
  - Preliminary Screen and Grit Removal
  - Primary Sedimentation
  - Bioroughing Towers
  - HPO Activated Sludge
  - Chlor/Dechlor then discharge to Ohio River
    - Either by Gravity or Pumping

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Morris Forman WQTC

- Residuals Treatment consists of:
  - Sludge Thickening - DAFT
  - Anaerobic Digestion – Primary Solids Only
  - Dewatering - Centrifuges
  - Drying – Andritz Dryers
  - Louisville Green Fertilizer

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20 Year Facility Plan

Planning Began in 2014

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April 8, 2015

- Ohio River elevated causing effluent to be pumped
- Thunderstorm caused power surge at high yard
- Power loss to entire plant for 8 hours

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April 8, 2015

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April 8-9, 2015

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The Perfect Storm

- 20 Year Facility Plan just starting
- The Great Flood
- Perfect time for a 50 Year Visioning Study

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How do you plan for 50 years in the future?

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Treatment Goals

- Secondary Bypass Reduction
- Nutrient Standards
- Emerging Constituents
- Disinfection
- Residuals Management

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Current Plant Loadings – Dry Weather

	Average Day Dry Flow and Loading	Average Day Conc (mg/l)	Max 30 day Flow and Loading	Max 30 day Conc (mg/l)	Peak 7 Day Loading	Peak 7 Day Conc (mg/l)
Flow, MGD	100.0		147.2		197.5	
BOD, lbs/day	172,515	267	287,735	315	365,986	415
TSS, lbs/day	257,277	333	332,599	379	412,277	482

- 50 yr projection is for population to decrease, loadings to remain consistent
- Increase flow and loading by 0.15% for dry weather scenarios

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Secondary Bypass Reduction

- Currently permitted to bypass 210 MGD during wet weather
- Agencies are looking for additional treatment of bypasses
- Nutrient Standards
- BUT Consent Decree sending more wet weather flow to MFWQTC

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Secondary Bypass ~~Reduction~~ Increase ?

- 10-20 year Goal – Wet Weather TSS Removal
  - New Wet Weather Facilities have some TSS Removal
  - Enhanced Primary Treatment
- 40-50 year Goal – Full Secondary Bypass Treatment
  - Step Feed Technology

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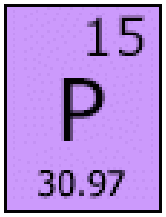
Nutrient Standards

Current Discharge Limits do not require Nutrient Removal

- 20 year Goal – Nitrogen to 10 mg/l
  Phosphorus to 1 mg/l

- 40 year Goal – Nitrogen to 3 mg/l
  Phosphorus to 0.2 mg/l



What technologies? How much space?

Conventional BNR, Carbon Capture and Deammonification

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Emerging Constituents

Micro Constituents - At the mercy of the Regulators

- 20 year Goal – Treatment of Biodegradable and absorbable
- 40 year Goal – Treatment of Biodegradable, non biodegradable and non absorbable

What Technology? Is this still being developed?

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Disinfection

Currently use Sodium Hypochlorite

Emerging concerns with disinfection byproducts

- 20 yr Goal – Restrict disinfection byproduct formation
- 30 yr Goal – Change indicator organism
- 40 yr Goal – Disinfection to include Micro constituent destruction

What Technology?

UV Disinfection, Ozone

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Residuals Management

Currently replacing existing Dryer System to maintain Class A production

- EPA 503 regulation changes
- Nutrient Management
- Air Quality
- Greenhouse Gas
- Public Acceptance

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Residuals Management

What is the next Technology?

- Continue Drying
- Thermal Hydrolysis
- Incineration
- Landfill

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MFWQTC – Site Assessment

- 64 structural assets identified for inspection

- 47 were inspected
  - Buildings
  - Tanks
  - Tunnels

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MFWQTC – Site Assessment

Condition Score	Description
1	Very Good, New or nearly new condition
2	Good, Minor wear, no impact on level of service
3	Fair, Major wear impacting level of service
4	Poor, Failure Imminent, unable to meet level of service
5	Very Poor, Failed, requires replacement

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MFWQTC – Site Assessment

Condition Score	Remaining Life
1	90%
2	75%
3	50%
4	25%
5	0%

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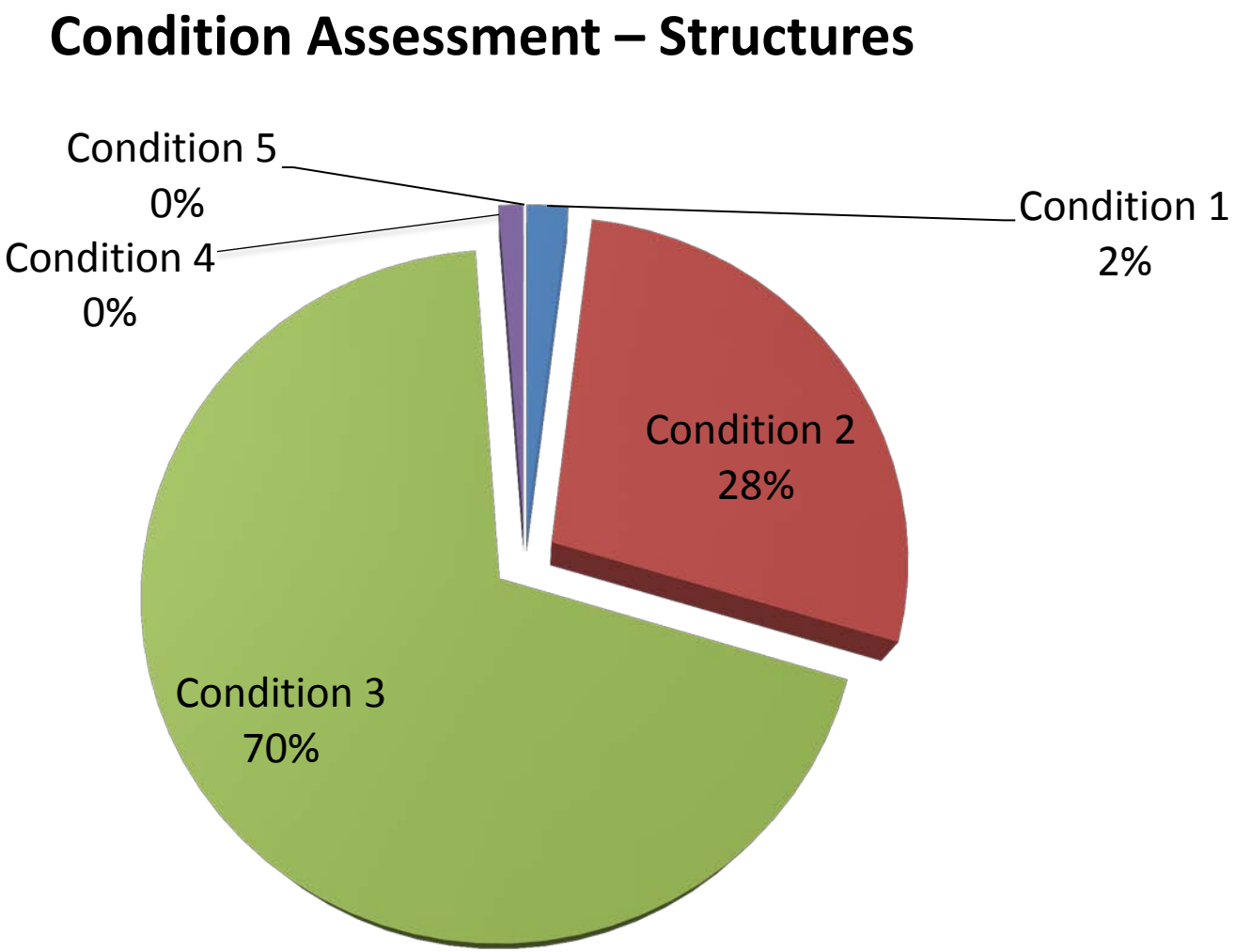
MFWQTC – Site Assessment



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MFWQTC – Site Assessment

- Structural Engineer Inspection
- Provided Estimated Capital Costs

Capital Cost Opinion Range		
-30%	Median Cost	50%
$2.3 M	$3.2 M	4.9M

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MFWQTC – Site Assessment

- 54 specific equipment assets types identified for inspection
  - Pump
  - Mixer
  - Blower
  - Valve
- Over 3000 individual pieces of equipment
- 365 were inspected

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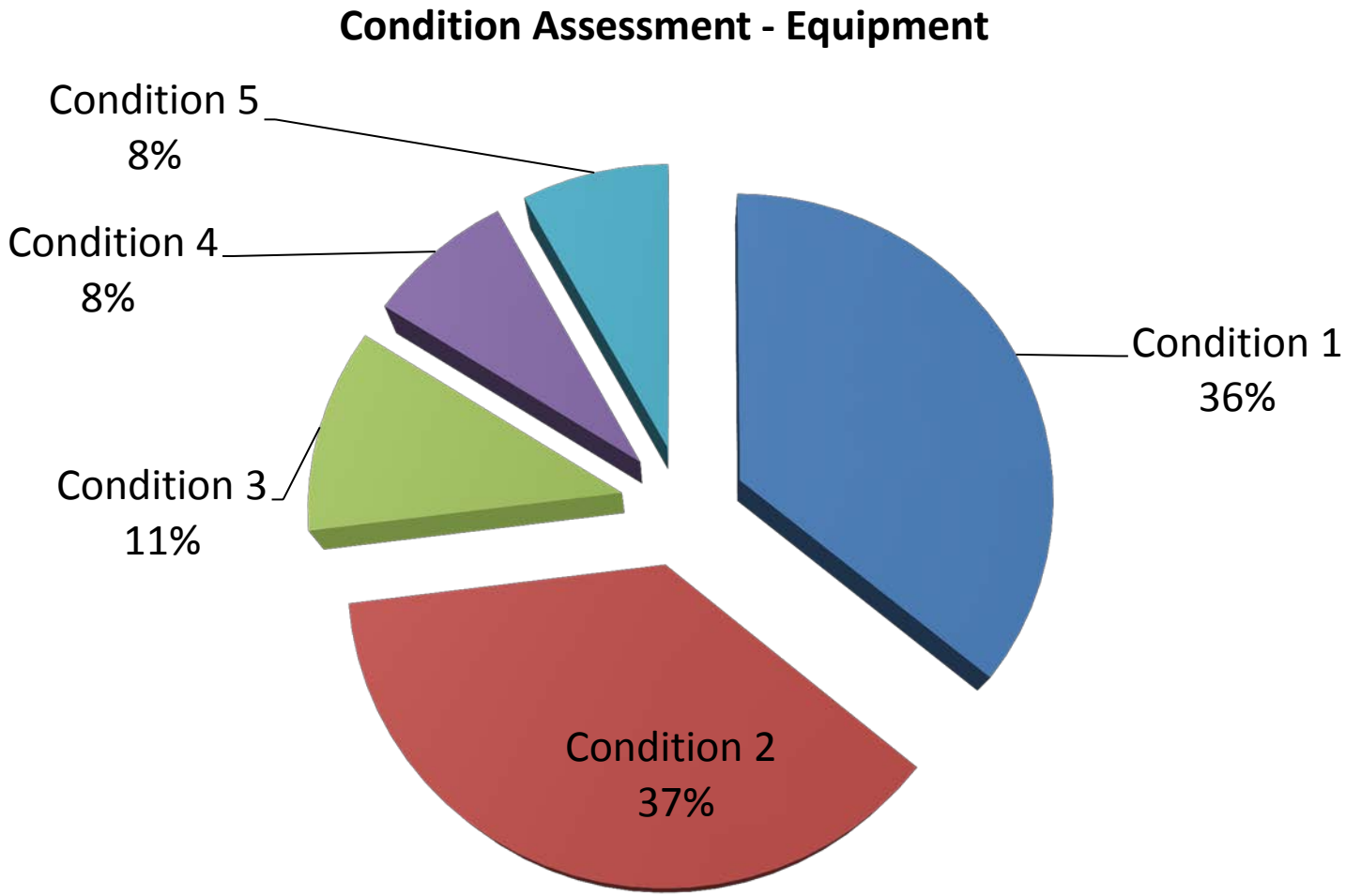
MFWQTC – Site Assessment



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MFWQTC – 50 Yr Plan

- ☑ Maintain Public Health and Future Regulations
- ☑ Have a Plan
- ☑ Have ideas on the Technologies
- ☑ Have a list of Assets to fix

Money and Property – still a work in progress.

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Thank You

Questions

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