Gwinnett

# Practical Applications for WIMS Custom Data Entry Forms

*Elizabeth Rideout*

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# Introduction

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# Gwinnett County Facilities

- F. Wayne Hill WRF:  60 MGD
- Yellow River WRF: 22 MGD
- Crooked Creek WRF: 16 MGD
- Lanier Filter Plant & Shoal Creek Filter Plant: 200 MGD Combined Production Capacity
- 1 Million Residents

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# Benefits of Custom Data Entry Forms

- Consolidate number of entry sheets required
- Encapsulate complex processes
- Customize by facility
- Perform real-time calculations
- Monitor plant performance

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# Water Production Use Cases

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# LANIER FILTER PLANT

**Laboratory Bench Sheet**

**Monday, August 28, 2023**

| TIME | RAW WATER | | | OZONATED RAW WATER | | | | | POST FLOC | FILTERED WATER | | | FINISHED WATER | | | | | | | | | | | RECYCLED WATER | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Alkalinity | Fe | Mn | Conductivity | pH | | Turbidity | Raw Pre Cl2 Residual | Turbidity | pH | Combined Turbidity | Combined Turbidity | pH | | CHLORINE RESIDUAL | | | | Alkalinity | Fe | Mn | Conductivity | Phosphate | Fluoride | pH | Turbidity | OPERATOR INITIALS | SHIFT SUPERVISOR INITIALS | TIME |
| | | | | | BENCH | TEMP (C) | BENCH | | BENCH | BENCH | IN-LINE | BENCH | IN-LINE | BENCH | CHANNEL | OVERFLOW | IN-LINE MIN PRIMARY | BENCH | | | | | | | BENCH | BENCH | | | |
| 1:AM | | | | | | | | | | | 0.03 | | 6.85 | | 3.25 | | 2.32 | 2.47 | | | | | | | | | JR | | 1:AM |
| 2:AM | | | | | 6.49 | 21.00 | 0.498 | | 1.08 | 6.39 | 0.03 | 0.050 | 6.86 | 7.25 | | | 2.33 | 2.33 | | | | | 0.93 | 0.76 | | | JR | | 2:AM |
| 3:AM | 14 | 0.02 | 0.00 | | | | | | | | 0.03 | | 6.89 | | 3.14 | 2.40 | 2.32 | 2.35 | 23 | 0.01 | 0.006 | | | | 6.97 | 0.48 | RV | | 3:AM |
| 4:AM | | | | | | | | | | | 0.03 | | 6.90 | | | | 2.31 | 2.33 | | | | | | | | | RV | | 4:AM |
| 5:AM | | | | | | | 0.438 | | | | 0.03 | 0.061 | 6.91 | | 3.04 | | 2.31 | 2.34 | | | | | | | | | RV | | 5:AM |
| 6:AM | | | | | | | | | | | 0.03 | | 6.92 | | | | 2.31 | 2.34 | | | | | | | | | RV | | 6:AM |
| 7:AM | | | | 51.8 | | | | | | | 0.03 | | 6.93 | | 2.99 | | 2.30 | 2.30 | | | | 85.2 | | | | | LO | MT | 7:AM |
| 8:AM | | | | | 6.34 | 21.00 | 0.454 | | 0.91 | 6.27 | 0.03 | 0.044 | 6.96 | 7.17 | | | 2.30 | 2.32 | | | | | 0.97 | 0.81 | | | LO | | 8:AM |
| 9:AM | 14 | 0.03 | 0.00 | | | | | | | | 0.03 | | 6.96 | | 3.12 | 2.40 | 2.30 | 2.31 | 24 | 0.02 | 0.007 | | | | 6.63 | 0.36 | LO | | 9:AM |
| 10:AM | | | | | | | | | | | 0.03 | | 6.95 | | | | 2.31 | 2.34 | | | | | | | | | LO | | 10:AM |
| 11:AM | | | | | | | 0.456 | | | | 0.03 | 0.049 | 6.94 | | 2.95 | | 2.32 | 2.40 | | | | | | | | | MC / ZH | | 11:AM |
| 12:N | | | | | | | | | | | 0.03 | | 6.93 | | | | 2.33 | 2.22 | | | | | | | | | ZH | | 12:N |
| 1:PM | | | | | | | | | | | 0.03 | | 6.91 | | 2.81 | | 2.31 | 2.31 | | | | | | | | | ZH | | 1:PM |
| 2:PM | | | | | 6.36 | 22.00 | 0.435 | | 1.02 | 6.29 | 0.03 | 0.043 | 6.89 | 7.16 | | | 2.31 | 2.28 | | | | | 0.94 | 0.77 | | | ZH | | 2:PM |
| 3:PM | 13 | 0.03 | 0.00 | | | | | | | | 0.03 | | 6.88 | | 2.96 | 2.41 | 2.31 | 2.32 | 23 | 0.01 | 0.009 | | | | 6.89 | 1.01 | SS | | 3:PM |
| 4:PM | | | | | | | | | | | 0.03 | | 6.88 | | | | 2.30 | 2.41 | | | | | | | | | SS | | 4:PM |
| 5:PM | | | | | | | 0.441 | | | | 0.03 | 0.052 | 6.88 | | 2.88 | | 2.29 | 2.33 | | | | | | | | | SS | | 5:PM |
| 6:PM | | | | | | | | | | | 0.03 | | 6.88 | | | | 2.29 | 2.38 | | | | | | | | | SS | | 6:PM |
| 7:PM | | | | | | | | | | | 0.03 | | 6.85 | | 2.96 | | 2.28 | 2.19 | | | | | | | | | RV | SS | 7:PM |
| 8:PM | | | | | 6.43 | 21.00 | 0.433 | | 0.89 | 6.42 | 0.03 | 0.059 | 6.84 | 7.12 | | | 2.28 | 2.30 | | | | | 0.96 | 0.80 | | | RV | | 8:PM |
| 9:PM | 14 | 0.02 | 0.00 | | | | | | | | 0.03 | | 6.85 | | 2.78 | 2.34 | 2.27 | 2.27 | 24 | 0.01 | 0.005 | | | | 7.02 | 0.60 | RV | | 9:PM |
| 10:PM | | | | | | | | | | | 0.03 | | 6.90 | | | | 2.28 | 2.30 | | | | | | | | | RV | | 10:PM |
| 11:PM | | | | | | | 0.465 | | | | 0.03 | 0.076 | 6.94 | | 2.85 | | 2.31 | 2.33 | | | | | | | | | JWW | | 11:PM |
| 12:M | | | | | | | | | | | 0.03 | | 6.97 | | | | 2.31 | 2.36 | | | | | | | | | JWW | | 12:M |

| RAINFALL @ 12 MIDNIGHT: |
|---|
| 0.66 |

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# GWINNETT COUNTY DWR

## Water Production Division

## State Report - Lanier Filter Plant

**Monday, August 28, 2023**

| Description | Units | Value |
|---|---|---|
| **Quantity Withdrawn From Permitted Source:** | | |
| Lanier | MG | 32.90 |
| To Shoal Creek | | 0.00 |
| Combined | | 32.90 |
| **Water Usage** | | |
| Processed or Treated thru Plant | MG | 33.33 |
| Treated Water Pumped to Dist. System | MG | 81.41 |
| **Raw Water Quality** | | |
| pH | | 6.41 |
| Alkalinity | mg/L | 14 |
| Temp | ° C | 21 |
| Fe | mg/L | 0.03 |
| Mn | mg/L | 0.00 |
| Maximum Turbidity | NTU | 0.50 |
| Minimum Turbidity | NTU | 0.43 |
| **Plant Operation** | | |
| Total Hours Plant Operated | hrs | 24.00 |
| Number of Filters Actually in Use | | 12 |
| Maximum Settled Water Turbidity | NTU | 1.08 |
| **Combined Filtered Water Quality** | | |
| pH | | 6.34 |
| Maximum Turbidity | NTU | 0.03 |
| Minimum Turbidity | NTU | 0.03 |
| Average Turbidity | NTU | 0.03 |
| Total Number of Turbidity Measurements Performed | | 96.00 |
| Maximum Filtered Particles (in 3-15 micron range) | particles/100ml | 39.73 |
| **Parameters At Entry Point To Distribution System** | | |
| Fe | mg/L | 0.01 |
| Mn | mg/L | 0.01 |
| Fluoride | mg/L | 0.79 |
| Maximum pH | | 7.25 |
| Minimum pH | | 7.12 |
| Chlorine Minimum Free Available | mg/L | 2.19 |
| Chlorite (if ClO2 used) | mg/L | Left Blank Intentionally |
| Chlorine Dioxide (if ClO2 used) | mg/L | Left Blank Intentionally |
| **Measurements At Peak Hourly Flow** | | |
| Peak Hourly Flow (PHF) | MGD | 98.64 |
| Chlorine Free Available at PHF | mg/L | 2.34 |
| Giardia log Inactivation | | 30.59 |
| Virus log Inactivation (if ozone or chloramine used) | | 905.41 |
| **Minimum Free Chlorine Backup Data** | | |

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# Ferric Chloride Usage

| TIME | PLANT RATE (MGD) | DAY TANK LEVEL (ft) | | | |
|---|---|---|---|---|---|
| | | START HR | BEF FILL | AFT FILL | USED |
| 12 am | 34.65 | 3.723 | | | 0.013 |
| 1 am | 34.84 | 3.710 | | | 0.005 |
| 2 am | 35.49 | 3.705 | | | 0.017 |
| 3 am | 35.26 | 3.688 | | | 0.004 |
| 4 am | 34.95 | 3.684 | | | 0.012 |
| 5 am | 35.48 | 3.672 | | | 0.009 |
| 6 am | 34.31 | 3.663 | | | 0.011 |
| 7 am | 34.73 | 3.652 | | | 0.010 |
| 8 am | 34.75 | 3.642 | | | 0.010 |
| 9 am | 35.15 | 3.632 | | | 0.012 |
| 10 am | 35.32 | 3.620 | | | 0.008 |
| 11 am | 35.33 | 3.612 | | | 0.008 |
| Noon | 35.01 | 3.604 | | | 0.012 |
| 1 pm | 35.08 | 3.592 | | | 0.009 |
| 2 pm | 34.51 | 3.583 | | | 0.012 |
| 3 pm | 34.52 | 3.571 | | | 0.007 |
| 4 pm | 34.92 | 3.564 | | | 0.006 |
| 5 pm | 35.45 | 3.558 | | | 0.005 |
| 6 pm | 35.36 | 3.553 | | | 0.019 |
| 7 pm | 35.32 | 3.534 | | | 0.008 |
| 8 pm | 35.29 | 3.526 | | | 0.007 |
| 9 pm | 35.22 | 3.519 | | | 0.005 |
| 10 pm | 34.46 | 3.514 | | | 0.011 |
| 11 pm | 34.78 | 3.503 | | | 0.009 |
| | | | 0.229 | ft soln used | |
| | | | 33.64 | gal soln used | |
| | | | 393 | lb soln used | |

# Chlorine Gas Usage

| SOUTH BANK SCALES WEIGHT (lb) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1 | | | 2 | | | 3 | | |
| MIN | MAX | END | MIN | MAX | END | MIN | MAX | END |
| 644 | 660 | 646 | 2629 | 2659 | 2631 | 3590 | 3607 | 3593 |
| 632 | 646 | 634 | 2602 | 2631 | 2603 | 3578 | 3595 | 3581 |
| 620 | 634 | 620 | 2572 | 2605 | 2575 | 3564 | 3581 | 3565 |
| 606 | 620 | 606 | 2545 | 2575 | 2547 | 3549 | 3567 | 3551 |
| 592 | 608 | 592 | 2516 | 2547 | 2519 | 3536 | 3552 | 3537 |
| 582 | 594 | 584 | 2494 | 2519 | 2495 | 3525 | 3539 | 3527 |
| 568 | 584 | 570 | 2467 | 2497 | 2469 | 3510 | 3527 | 3512 |
| 556 | 570 | 556 | 2440 | 2469 | 2443 | 3494 | 3512 | 3497 |
| 542 | 558 | 542 | 2408 | 2443 | 2410 | 3474 | 3499 | 3476 |
| 530 | 544 | 530 | 2382 | 2411 | 2384 | 3460 | 3476 | 3461 |
| 518 | 532 | 518 | 2356 | 2384 | 2357 | 3444 | 3463 | 3444 |
| 506 | 520 | 506 | 2329 | 2359 | 2331 | 3425 | 3447 | 3429 |
| 494 | 508 | 494 | 2304 | 2333 | 2305 | 3413 | 3431 | 3415 |
| 480 | 494 | 482 | 2275 | 2305 | 2277 | 3394 | 3415 | 3397 |
| 470 | 482 | 472 | 2254 | 2277 | 2256 | 3382 | 3399 | 3384 |
| 458 | 472 | 458 | 2228 | 2256 | 2229 | 3363 | 3385 | 3367 |
| 446 | 460 | 448 | 2202 | 2231 | 2203 | 3350 | 3369 | 3351 |
| 434 | 448 | 436 | 2176 | 2205 | 2177 | 3332 | 3353 | 3335 |
| 422 | 436 | 424 | 2151 | 2179 | 2153 | 3317 | 3335 | 3319 |
| 412 | 424 | 412 | 2126 | 2159 | 2127 | 3301 | 3319 | 3303 |
| 400 | 414 | 400 | 2100 | 2127 | 2102 | 3286 | 3305 | 3287 |
| 388 | 402 | 390 | 2074 | 2102 | 2076 | 3270 | 3289 | 3270 |
| 378 | 390 | 378 | 2048 | 2076 | 2050 | 3252 | 3272 | 3256 |
| 366 | 380 | 366 | 2024 | 2050 | 2024 | 3238 | 3256 | 3240 |
| 294 | lb Cl2 gas used | | 635 | lb Cl2 gas used | | 365 | lb Cl2 gas used | |

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## LFP Chemical Reorder Trigger Report

8/28/2023

| Variable Name | Variable Number | Current Value | Reorder Point | Needs Reordered? |
|---|---|---|---|---|
| LFP Ferric Chlor Soln Bulk Tank 1 Level End Day | 406333 | 6.55 | 4.25 | No |
| LFP Ferric Chlor Soln Bulk Tank 1 Level End Day | 406333 | 6.64 | 4.25 | No |
| LFP Cat Polymer Bulk Tank 1 Level End Day | 406205 | 4.03 | 3.00 | No |
| LFP Cat Polymer Bulk Tank 2 Level End Day | 406212 | 7.24 | 3.00 | No |
| LFP Ortho-P Soln Bulk Tank 1 Lvl End Day | 406116 | 5.33 | 4.25 | No |
| LFP Ortho-P Soln Bulk Tank 2 Lvl End Day | 406117 | 5.42 | 4.25 | No |
| LFP Ortho-P Soln Bulk Tank 3 Lvl End Day | 406119 | 5.33 | 4.25 | No |
| LFP Ortho-P Soln Bulk Tank 4 Lvl End Day | 406120 | 5.26 | 4.25 | **Yes** |
| LFP Fluoride Soln Bulk Tank 3 Level End Day | 406424 | 3.04 | 4.25 | **Yes** |
| LFP LOX Storage Tank Level End Day | 406510 | 233.25 | 180.00 | No |
| LFP Nitrogen Tank % Full @ End of Day | 406701 | 16.14 | 35.00 | **Yes** |
| LFP Lime Feed Tank Level End Day | 400675 | 16.77 | 10.00 | No |
| LFP Lime Storage Tank Level End Day | 400715 | 2.95 | 10.00 | **Yes** |

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# Lanier Filter Plant: Residuals Building Bench Sheet

Monday, August 28, 2023

## Batch Conditioning

| Time | Batch # | Pre-Clarifier # | Gravity Thickener # | CT #1 Level Start (Ft) | CT #1 Level Finish (Ft) | CT #2 Level Start (Ft) |
|---|---|---|---|---|---|---|
| 7:00 AM | | | | | | |
| 9:00 AM | | | | | | |
| 11:00 AM | | | | | | |
| 1:00 PM | | | | | | |
| 3:00 PM | | | | | | |
| 5:00 PM | | | | | | |
| 7:00 PM | | | | | | |

## Pre-Clarification Basin Lab Bench Sheet

| | TSS (mg/L) | | pH (SU) | | Turbidity (NTU) | |
|---|---|---|---|---|---|---|
| Basin # | Influent | Effluent | Influent | Effluent | Influent | Effluent |
| | | | | | | |

## Filter Press Operations

| Time | Press #1 Run # | Press #2 Run # | Feed Cycle End Setpoint (GPM) | Feed Cycle Total Time (Mins) | Feed Cycle Total Volume (Gals) | Cake Solids (%) |
|---|---|---|---|---|---|---|
| 7:00 AM | | | | | | |
| 9:00 AM | | | | | | |
| 11:00 AM | | | | | | |
| 1:00 PM | | | | | | |
| 3:00 PM | | | | | | |
| 5:00 PM | | | | | | |
| 7:00 PM | | | | | | |

## Sludge Blanket Log

| Time | Pre-Clarifier # | Gravity Thickener # | Center Level (ft) | Side Level (ft) | Operator Initials |
|---|---|---|---|---|---|
| 7:00 AM | | | | | |
| 9:00 AM | | | | | |
| 11:00 AM | | | | | |
| 1:00 PM | | | | | |
| 3:00 PM | | | | | |
| 5:00 PM | | | | | |
| 7:00 PM | | | | | |

## Residuals Daily Operations

| Quantity of Runs | Pressed Sludge (gals) | Average Cake % Solids | Dumpsters Emptied | Dumpster Weight (Wet Tons) | Dumpster Weight (Dry Tons) | Preclarifier Withdrawal Volume (gals) |
|---|---|---|---|---|---|---|
| | | | | | | |

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# Water Reclamation Use Cases

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| A | B | C | D | E | F | G | H | I | J |
|---|---|---|---|---|---|---|---|---|---|
| CC WRF Wasting Calculator | | | | | | | | | |
| 8/28/2023 | | | | | | | | | |
| | | | | | | | | | |
| Target Aerobic SRT | 7.0 | | Entered by Plant Staff | | | | | Calculated Aerated Volume | |
| MLSS | 3113 | | Lab Data | | | | BRB 1 | 2.25 | MG |
| Aerobic Vol | 4.50 | | Pe-Set for 2 Bios | | | | BRB 2 | 2.25 | MG |
| RAS TSS | 13455 | | Lab Data | | | | BRB 3 | 0.00 | MG |
| WAS Flow, MGD | 0.15 | | Calculated Value | | | | BRB 4 | 0.00 | MG |
| WAS Flow, gpm | 103 | | Plant target for wasting | | | | | | |
| | | | | | | | | | |
| | | | | | | | | 2.25 with AER1-7 aerobic | |
| | | | | | | | | 2.45 with AX3 also aerobic | |
| 3-day Moving Avg SRT | | | | | | | | 2.65 with AX2, AX3 also aerobic | |
| 3-dayAerobic SRT | 7.0 | | Entered by Plant Staff | | | | | | |
| MLSS | 3083 | | Lab Data | | | | | | |
| Aerobic Vol | 4.50 | | Pe-Set for 2 Bios | | | | | | |
| RAS TSS | 12647 | | Lab Data | | | | | | |
| WAS Flow, MGD | 0.16 | | Calculated Value | | | | | | |
| 3-day Mov Avg WAS Flow, gpm | 109 | | Plant target for wasting | | | | | | |
| | | | | | | | | | |

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| Ostara Reactor 1 Effluent Lab Data | | | |
|---|---|---|---|
| | Day | Night | |
| Reactor 1 Effluent OP | | | mg/L |
| Reactor 1 Effluent TP | | | mg/L |
| Reactor 1 Effluent Mg | | | mg/L |
| Reactor 1 Effluent pH | | | mg/L |
| Reactor 1 Effluent N | | | mg/L |
| Reactor 1 Effluent TSS | | | mg/L |
| Reactor 1 OP Removal Effficiency | | % | |
| Reactor 1 TP Removal Effficiency | | % | |
| Reactor 1 Mg Removal Effficiency | 100 | % | |
| Reactor 1 Ca Removal Effficiency | 100 | % | |
| Reactor 1 NH3 Removal Effficiency | 100 | % | |
| Reactor 1 TSS Removal Effficiency | 100 | % | |
| Reactor 1 Ortho P Load | 186 | kg/d | |
| FWH Reactor 1 Fines Loss | | % | |
| FWH Reactor 1 % Yield | | % | |

| Entries from Pearl Ostara Program | |
|---|---|
| P Loading Rate (Same across both reactors) | 158.00 |
| Centrate PO4 (Same across both reactors) | 83.00 |
| Filtrate PO4 (Same across both reactors) | 88.00 |
| Ratio (Same across both reactors) | 2 |
| Struvite Growth Ostara | 2760 |
| Combined Influent PO4 (Same across both reactors) | 86 |
| Reactor #1 Efficiency | |
| Reactor #2 Efficiency | 0.61 |
| **Calculated Seed Amount (Based on Entries Above)** | |
| Calculated Seed Amount for Reactor #1 | |
| Calculated Seed Amount for Reactor #2 | 201 |
| **Operator Entries Based on Seed Type and Weight** | |
| Type of Seed for Reactor #1 | |
| Type of Seed for Reactor #2 | 45 SGN |
| Actual Seed Weight Delivered to Reactor #1 | |
| Actual Seed Weight Delivered to Reactor #2 | |

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# Ozone Residuals

## Tuesday, August 29, 2023

### Pre Ozone Residuals

| | 12:00am | 4:00am | 8:00am | 12:00pm | 4:00pm | 8:00pm | AVG Daily Dosage |
|---|---|---|---|---|---|---|---|
| Contactor #1 Sample Port #1 | | | 0.34 | | | | |
| Contactor #1 Sample Port #2 | | | 0.22 | | | | |
| Contactor #2 Sample Port #1 | | | 0.29 | | | | |
| Contactor #2 Sample Port #2 | | | 0.18 | | | | |
| Contactor #3 Sample Port #1 | | | | | | | |
| Contactor #3 Sample Port #2 | | | | | | | |
| Contactor #4 Sample Port #1 | | | | | | | |
| Contactor #4 Sample Port #2 | | | | | | | |

### Post Ozone Residuals

| | 12:00am | 4:00am | 8:00am | 12:00pm | 4:00pm | 8:00pm | AVG Daily Dosage |
|---|---|---|---|---|---|---|---|
| Contactor #1 Sample Port #0 | | | | | | | |
| Contactor #1 Sample Port #1 | | | | | | | |
| Contactor #1 Sample Port #2 | | | | | | | |
| Contactor #2 Sample Port #0 | | 0.20 | 0.49 | | 0.32 | | |
| Contactor #2 Sample Port #1 | | | | | | | |
| Contactor #2 Sample Port #2 | | 0.10 | 0.19 | | 0.16 | | |
| Contactor #4 Sample Port #0 | | 0.21 | 0.40 | | 0.18 | | |
| Contactor #4 Sample Port #1 | | | | | | | |
| Contactor #4 Sample Port #2 | | 0.04 | 0.23 | | 0.22 | | |
| Contactor #5 Sample Port #0 | | | | | | | |
| Contactor #5 Sample Port #1 | | | | | | | |
| Contactor #5 Sample Port #2 | | | | | | | |

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# Solids Concentrations

**Monday, August 28, 2023**

| | 2:00am | 8:00am | 2:00pm | 8:00pm |
|---|---|---|---|---|
| | Primary Sludge Solids, % TS | | | |
| Pri Clar #1 | | | | |
| Pri Clar #2 | | 2.68 | | |
| Pri Clar #3 | | | | |
| Pri Clar #4 | | 2.16 | | |
| Pri Clar #5 | | | | |
| Pri Clar #6 | | 2.63 | | |
| Pri Clar #7 | | | | |
| Pri Clar #8 | | 2.33 | | |
| Pri Clar #9 | | 2.29 | | |
| Pri Clar #10 | | 2.42 | | |

| TSS, mg/L | |
|---|---|
| Influent | 252 |
| Primary Influent | 160.00 |
| Primary Effluent | 56.00 |

| RAS/WAS, RDT Feed | |
|---|---|
| Combined Feed @ RDT, % TS | 1.42 |
| Primary Sludge, Avg % TS | 2.42 |
| RAS/ WAS TSS, mg/L | 11379 |

| | 2:00am | 8:00am | 2:00pm | 8:00pm |
|---|---|---|---|---|
| | Bioreactors MLSS, mg/L | | | |
| Bio #1 | | | | |
| Bio #2 | | 4215 | | |
| Bio #3 | | 4502 | | |
| Bio #4 | | 4292 | | |
| Bio #5 | | 4167 | | |
| Bio #6 | | | | |
| Bio #7 | | 4385 | | |
| Bio #8 | | | | |
| Bio #9 | | | | |
| Bio #10 | | 4274 | | |

| | Settleometers | | | SVI, mL/g |
|---|---|---|---|---|
| | 5 min | 30 min | 60 min | 30 min |
| Bio #1 | | | | |
| Bio #2 | | | | |
| Bio #3 | | | | |
| Bio #4 | | | | |
| Bio #5 | | | | |
| Bio #6 | | | | |
| Bio #7 | | | | |
| Bio #8 | | | | |
| Bio #9 | | | | |
| Bio #10 | | | | |
| Target SVI Range (mL/g) - 80-120 | | | | |

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# ROTATING DRUM THICKENERS

## Tuesday, August 29, 2023

Centrate TSS Target < 200 mg/L, TWAS Target: 7.5% - 8.5 %

| | Night AM | Day AM | Day PM | Night PM |
|---|---|---|---|---|
| **RDT #1** | | | | |
| Time | 1230 | 0730 | | |
| Centrate TSS | 51 | 58 | | |
| TWAS %TS | *7.63* | *7.54* | | |
| WAS GPM | 291.00 | 291.00 | | |
| PS GPM | | | | |
| Polymer Ratio | 27.00 | 27.00 | | |
| Polymer GPM* | TBD | TBD | TBD | TBD |
| Polymer, lb/DT* | TBD | TBD | TBD | TBD |
| Solids Loading Rate lb/hr | 1893 | 1893 | | |
| Solids Capture Rate % | 99.67 | 99.63 | | |
| Drum Speed | 25.00 | 25.00 | | |
| Grease Can. % | 79.00 | 77.00 | | |

| | Night AM | Day AM | Day PM | Night PM |
|---|---|---|---|---|
| **RDT #2** | | | | |
| Time | 1230 | 0730 | 1249 | |
| Centrate TSS | 89 | 12 | 28 | |
| TWAS %TS | 7.02 | 6.83 | 6.74 | |
| WAS GPM | 302.00 | 297.00 | 297.00 | |
| PS GPM | | | | |
| Polymer Ratio | 22.00 | 23.00 | 23.00 | |
| Polymer GPM* | TBD | TBD | TBD | TBD |
| Polymer, lb/DT* | TBD | TBD | TBD | TBD |
| Solids Loading Rate lb/hr | 1965 | 1932 | 1932 | |
| Solids Capture Rate % | 99.44 | 99.93 | 99.83 | |
| Drum Speed | 25.00 | 25.00 | 25.00 | |
| Grease Can. % | 79.00 | 77.00 | 76.00 | |

| | | | | |
|---|---|---|---|---|
| **RDT #3** | | | | |
| Time | | | | |
| Centrate TSS | | | | |
| TWAS %TS | | | | |
| WAS GPM | | | | |
| PS GPM | | | | |
| Polymer Ratio | | | | |
| Polymer GPM* | TBD | TBD | TBD | TBD |
| Polymer, lb/DT* | TBD | TBD | TBD | TBD |
| Solids Loading Rate lb/hr | | | | |

| | | | | |
|---|---|---|---|---|
| **RDT #4** | | | | |
| Time | | | | |
| Centrate TSS | | | | |
| TWAS %TS | | | | |
| WAS GPM | | | | |
| PS GPM | | | | |
| Polymer Ratio | | | | |
| Polymer GPM* | TBD | TBD | TBD | TBD |
| Polymer, lb/DT* | TBD | TBD | TBD | TBD |
| Solids Loading Rate lb/hr | | | | |

Gwinnett

## Operations Process Control lab

**Tuesday, August 29, 2023**

| Temperature | 2am | 8am | 2pm | 8pm |
|---|---|---|---|---|
| Influent | 23.00 | 22.60 | 28.00 | 23.00 |
| Primary Inf | 23.60 | 23.30 | 28.50 | 23.60 |
| Primary Eff | 23.50 | 23.20 | 28.40 | 24.30 |
| Bio #1 Eff | | | | |
| Bio #2 Eff | 24.10 | 23.80 | 27.80 | 25.10 |
| Bio #3 Eff | 24.10 | 23.80 | 28.00 | 25.00 |
| Bio #4 Eff | 24.20 | 24.00 | 28.00 | 25.00 |
| Bio #5 Eff | 24.10 | 24.20 | 27.60 | 24.90 |
| Bio #6 Eff | | | | |
| Bio #7 Eff | 24.10 | 24.10 | 27.90 | 24.80 |
| Bio #8 Eff | | | | |
| Bio #9 Eff | | | | |
| Bio #10 Eff | 23.90 | 24.20 | 28.20 | 24.90 |
| Secondary Eff | 23.80 | 24.20 | 28.50 | 25.20 |
| Secondary Eff - Duplicate | 23.80 | | | |
| Membrane Inf | 24.60 | 23.90 | 30.00 | 25.00 |
| Pre-Ozone Inf | 24.90 | 23.80 | 29.60 | 25.20 |
| Final Effluent | 25.00 | 24.10 | 28.60 | 25.40 |

| pH | 2am | 8am | 2pm | 8pm |
|---|---|---|---|---|
| Influent | 6.99 | 7.18 | 7.16 | 7.31 |
| Primary Inf | 7.13 | 6.95 | 7.28 | 7.39 |
| Primary Eff | 7.09 | 7.29 | 7.28 | 7.22 |
| Bio #1 Eff | | | | |
| Bio #2 Eff | 6.61 | 6.77 | 6.67 | 6.64 |
| Bio #3 Eff | 6.59 | 6.78 | 6.60 | 6.65 |
| Bio #4 Eff | 6.58 | 6.71 | 6.60 | 6.63 |
| Bio #5 Eff | 6.55 | 6.70 | 6.63 | 6.59 |
| Bio #6 Eff | | | | |
| Bio #7 Eff | 6.56 | 6.76 | 6.63 | 6.63 |
| Bio #8 Eff | | | | |
| Bio #9 Eff | | | | |
| Bio #10 Eff | 6.57 | 6.67 | 6.61 | 6.60 |
| Secondary Eff | 7.03 | 7.09 | 7.10 | 6.91 |
| Secondary Eff - Duplicate | 7.03 | | | |
| Membrane Inf | 6.96 | 7.02 | 7.07 | 6.93 |
| Pre-Ozone Inf | 6.96 | 7.05 | 7.06 | 7.09 |

| Orthophosphate PO4-P | 2am | 8am | 2pm | 8pm |
|---|---|---|---|---|
| Influent | 3.20 | 4.20 | 12.60 | 6.40 |
| Primary Inf | 4.40 | 4.20 | 13.60 | 5.80 |
| Primary Eff | 4.80 | 4.20 | 7.20 | 5.40 |
| Bio #1 Eff | | | | |
| Bio #2 Eff | 0.08 | 0.04 | 0.07 | 0.07 |
| Bio #3 Eff | 0.07 | 0.04 | 0.06 | 0.07 |
| Bio #4 Eff | 0.08 | 0.04 | 0.06 | 0.08 |
| Bio #5 Eff | 0.09 | 0.04 | 0.06 | 0.09 |
| Bio #6 Eff | | | | |
| Bio #7 Eff | 0.08 | 0.04 | 0.08 | 0.07 |
| Bio #8 Eff | | | | |
| Bio #9 Eff | | | | |
| Bio #10 Eff | 0.09 | 0.04 | 0.06 | 0.08 |
| Secondary Eff | 0.08 | 0.07 | 0.09 | 0.07 |
| Secondary Eff - Duplicate | 0.08 | 0.08 | 0.09 | 0.08 |
| Membrane Inf | 0.02 | 0.02 | 0.04 | 0.03 |
| Pre-Ozone Inf | 0.02 | 0.01 | 0.02 | 0.03 |
| Final Effluent | 0.01 | 0.01 | 0.02 | 0.03 |

| Ammonia NH3-N | 2am | 8am | 2pm | 8pm |
|---|---|---|---|---|
| Influent | 32.20 | 33.60 | 43.00 | 50.80 |
| Primary Inf | 41.80 | 35.80 | 45.00 | 42.80 |
| Primary Eff | 21.20 | 16.80 | 28.20 | 29.60 |
| Bio #1 Eff | | | | |
| Bio #2 Eff | 0.34 | 0.22 | 0.25 | 0.21 |
| Bio #3 Eff | 0.36 | 0.23 | 0.24 | 0.24 |

| Alkalinity | 2am | 8am | 2pm | 8pm |
|---|---|---|---|---|
| Influent | | 178.00 | | 270.00 |
| Primary Eff | | 190.00 | | 200.00 |
| Secondary Eff | | 112.00 | | 110.00 |
| Final Effluent | | 84.00 | | 102.00 |

| Nitrate | 2am | 8am | 2pm | 8pm |
|---|---|---|---|---|
| Influent | | 0.62 | | |
| Prim Eff | | 2.84 | | |
| Bio #1 Eff | | | | |
| Bio #2 Eff | | 6.00 | | |
| Bio #3 Eff | | 5.11 | | |
| Bio #4 Eff | | 7.15 | | |

Gwinnett

# ZeeWeed Recovery Clean Operator Log

**Tuesday, August 29, 2023**

**Please collect all data; do not leave blanks**

| | | | Before Clean | | | Cl Residual or pH | | | After Clean | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cleaning Chemical | Am't Used | Flow | TMP | # Modules Isolated | Start (30 min after Mix) | Middle | End | Flow | TMP | # Modules Isolated | Soak Time | Feed Water Temp when Back in Operation |
| **Train 1** | | | | | | | | | | | | | |
| First Cleaning | | | | | | | | | | | | | |
| Second Cleaning | | | | | | | | | | | | | |
| **Train 2** | | | | | | | | | | | | | |
| First Cleaning | | | | | | | | | | | | | |
| Second Cleaning | | | | | | | | | | | | | |
| **Train 3** | | | | | | | | | | | | | |
| First Cleaning | | | | | | | | | | | | | |
| Second Cleaning | | | | | | | | | | | | | |
| **Train 4** | | | | | | | | | | | | | |
| First Cleaning | | | | | | | | | | | | | |
| Second Cleaning | | | | | | | | | | | | | |
| **Train 5** | | | | | | | | | | | | | |
| First Cleaning | | | | | | | | | | | | | |
| Second Cleaning | | | | | | | | | | | | | |
| **Train 6** | | | | | | | | | | | | | |
| First Cleaning | | | | | | | | | | | | | |
| Second Cleaning | | | | | | | | | | | | | |

Citric
Hypo

Gwinnett

| | | Belt Filter Press #1 | | Belt Filter Press #2 | | Belt Filter Press #3 | | Belt Filter Press #4 | |
|---|---|---|---|---|---|---|---|---|---|
| | Mon, Aug 28 | Sludge Feed Rate gpm | Dilution Water gph | Sludge Feed Rate gpm | Dilution Water gph | Sludge Feed Rate gpm | Dilution Water gph | Sludge Feed Rate gpm | Dilution Water gph |
| | 7 am | | | | | | | | |
| | 8 am | | | | | | | | |
| | 9 am | | | | | | | | |
| | 10 am | | | | | | | | |
| | 11 am | | | | | | | | |
| | Noon | | | | | | | | |
| | 1 pm | | | | | | | | |
| | 2 pm | | | | | | | | |
| | 3 pm | | | | | | | | |
| | 4 pm | | | | | | | | |
| | 5 pm | | | | | | | | |
| | 6 pm | | | | | | | | |
| | 7 pm | 201 | 224.63 | 193 | 0.00 | | | 150 | 167.14 |
| | 8 pm | 218 | 252.97 | 217 | 0.00 | | | 229 | 255.03 |
| | 9 pm | 219 | 250.02 | 217 | 0.00 | | | 229 | 256.64 |
| | 10 pm | 219 | 247.97 | 218 | 0.00 | | | 229 | 254.69 |
| | 11 pm | 219 | 257.56 | 218 | 0.00 | | | 230 | 251.15 |
| | Tue, Aug 29 | 220 | 251.86 | 217 | 0.00 | | | 231 | 257.07 |
| | 1 am | | | | | | | | |
| | 2 am | | | | | | | | |
| | 3 am | | | | | | | | |
| | 4 am | | | | | | | | |
| | 5 am | | | | | | | | |
| | 6 -7 am | | | | | | | | |
| Run Time Total (AM Shift) | | | | | | | | | hr |
| Run Time Total (PM Shift) | | 6.50 | | 6.50 | | | | 6.00 | hr |
| Total Sludge Feed | | 74039 | | 126594 | | 0 | | 130601 | gal |

Gwinnett

# Sludge Blanket Levels

## Tuesday, August 29, 2023

| | 12:00am | 4:00am | 8:00am | 12:00pm | 4:00pm | 8:00pm |
|---|---|---|---|---|---|---|
| **Primary Clarifiers** | | | | | | |
| #1 | | | | | | |
| #2 | | 5.00 | 5.50 | | 5.00 | 5.00 |
| #3 | | | | | | |
| #4 | | 6.00 | 5.00 | | 5.00 | 4.50 |
| #5 | | | | | | |
| #6 | | 5.00 | 4.50 | | 6.50 | 6.00 |
| #7 | | | | | | |
| #8 | | 5.00 | 4.00 | | 5.00 | 4.00 |
| #9 | | 6.00 | 5.50 | | 5.50 | 5.00 |
| #10 | | 4.00 | 4.50 | | 4.50 | 4.00 |
| **Recarb Clarifiers** | | | | | | |
| #1 | | | 0.00 | | | |
| #2 | | | 0.00 | | | |
| #3 | | | | | | |
| #4 | | | 0.00 | | | |
| **Plate Settling Chem Clarifiers** | | | | | | |
| #1 | | | 0.00 | | | |
| #2 | | | 0.00 | | | |
| #3 | | | 0.00 | | | |
| #4 | | | | | | |

| | Secondary Clarifiers | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | #1 | #2 | #3 | #4 | #5 | #6 | #7 | #8 | #9 | #10 |
| 12:00am | | | 5.00 | 10.00 | 1.00 | 1.00 | | 1.00 | | 1.00 |
| 1:00am | | | | | | | | | | |
| 2:00am | | | | | | | | | | |
| 3:00am | | | | | | | | | | |
| 4:00am | | | 2.00 | 9.00 | 2.00 | 1.00 | | 1.00 | | 1.00 |
| 5:00am | | | | | | | | | | |
| 6:00am | | | | | | | | | | |
| 7:00am | | | | | | | | | | |
| 8:00am | | | 1.50 | 5.00 | 4.00 | 3.00 | | 1.50 | | 0.50 |
| 9:00am | | | | | | | | | | |
| 10:00am | | | | | | | | | | |
| 11:00am | | | | | | | | | | |
| 12:00pm | | | 3.00 | 5.00 | 5.00 | 3.00 | | 2.00 | | 1.50 |
| 1:00pm | | | | | | | | | | |
| 2:00pm | | | | | | | | | | |
| 3:00pm | | | | | | | | | | |
| 4:00pm | | | 3.00 | 4.50 | 6.00 | 1.50 | | 1.50 | | 1.50 |
| 5:00pm | | | | | | | | | | |
| 6:00pm | | | | | | | | | | |
| 7:00pm | | | | | | | | | | |
| 8:00pm | | | 2.00 | 3.00 | 5.00 | 2.00 | | 1.00 | | 1.00 |
| 9:00pm | | | | | | | | | | |

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# Q&A

Feel free to contact me at Elizabeth.Rideout@gwinnettcounty.com

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