

DEWATERING BASICS

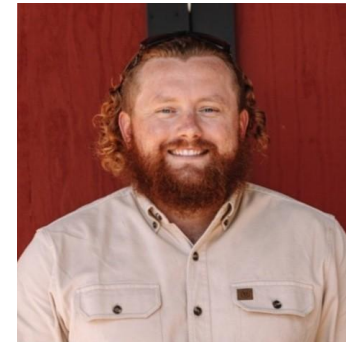
STORMWATER AWARENESS WEEK



Robin Tully, PE



Ric Campos



Spencer Davis, QSD



PRESENTORS

DEWATERING BASICS

STORMWATER AWARENESS WEEK



Scott Saling



BUSINESS DEVELOPMENT MANAGER – PRESENTATION
TECHNICAL SUPPORT



WORKSHOP OUTLINE

STORMWATER AWARENESS WEEK

DEWATERING OVERVIEW

Robin Tully



DEWATERING FIELD OPERATIONS

Ric Campos



WATER TREATMENT & DISCHARGE

Spencer Davis





DEWATERING OVERVIEW

THE BASICS

DEWATERING OVERVIEW

The Basics

CONSTRUCTION DEWATERING SOURCES

A list of the most common dewatering sources

WHAT PERMITS MAY APPLY

An overview of what MS4, NPDES or other permits may apply

TYPICAL DEWATERING METHODS

An overview of common construction dewatering methods

BASIC DEWATERING PLAN

What a basic dewatering plan may look like



CONSTRUCTION DEWATERING SOURCES

STORMWATER

GROUNDWATER

SURFACE WATER

**NON STORMWATER –
PIPE FLUSHING,
HYDRANT FLUSHING,
DRILLING SLURRY WATER,
POTHOLING OPERATIONS,
BORING OPERATIONS,
WASH WATER, ETC.**



CONSTRUCTION DEWATERING SOURCES

STORMWATER

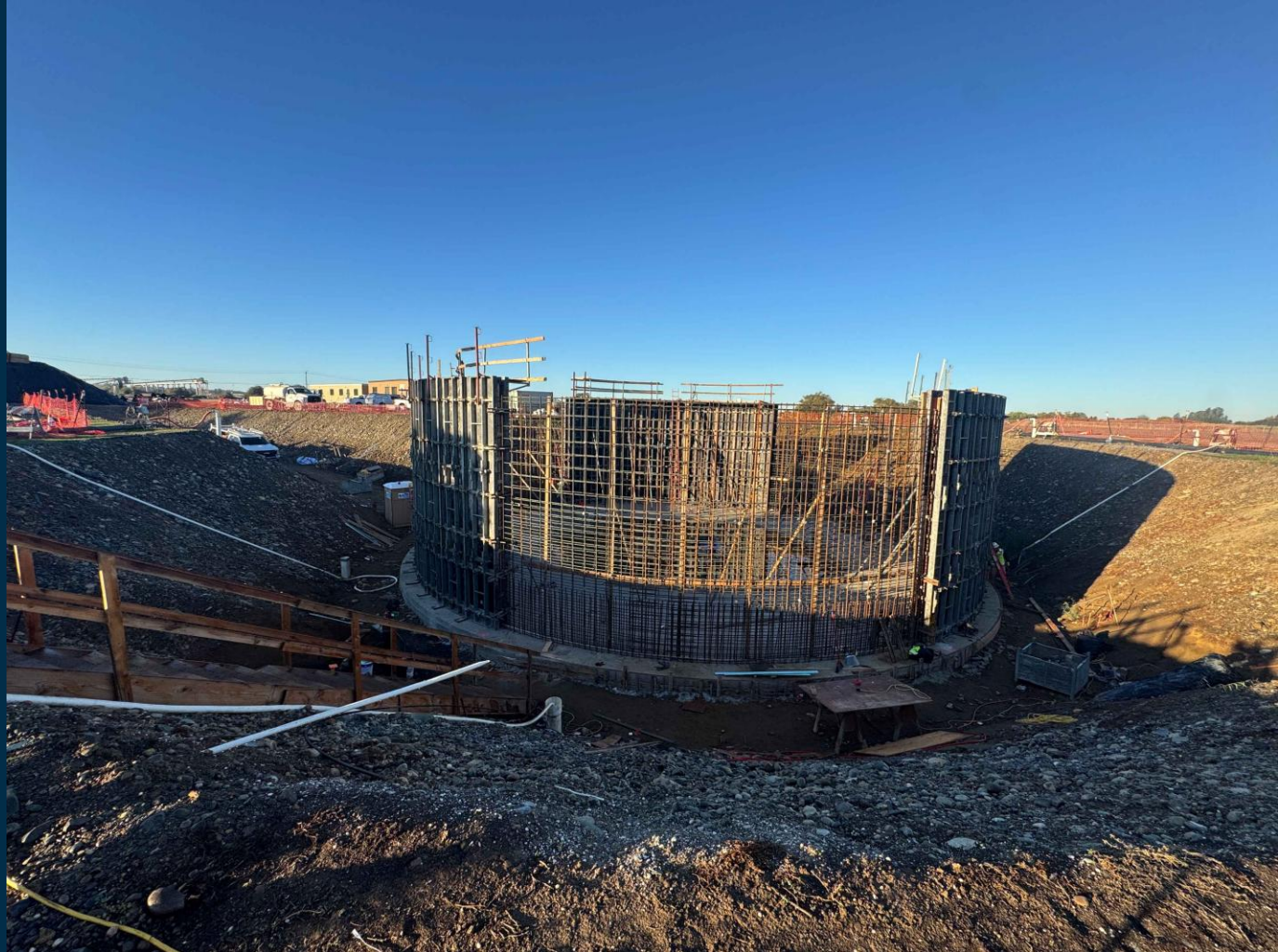
INCLUDING
PONDED OR
TRAPPED
STORMWATER
IN TRENCHES,
EXCAVATIONS,
FOOTINGS,
SITE
DEPRESSIONS,
ETC.



CONSTRUCTION DEWATERING SOURCES

GROUNDWATER

INCLUDING
ACTUAL AQUIFER
GROUNDWATER,
SHALLOW
PERCHED
GROUNDWATER,
EXCAVATION
GROUNDWATER,
ETC.



CONSTRUCTION DEWATERING SOURCES

SURFACE WATER

**IN RECEIVING
WATERS, DITCHES,
WATER BODIES,
ETC.**

**INCLUDING
WATER TRAPPED
WITHIN DIVERSION
AREAS**



CONSTRUCTION DEWATERING SOURCES

NON STORMWATER

INCLUDING
PIPE FLUSHING,
HYDRANT FLUSHING ,
DRILLING SLURRY WATER,
POTHOLING OPERATIONS,
BORING OPERATIONS,
BENTONITE SLURRY,
WASH WATER,
DUST CONTROL WATER,
ETC.



PHOTO; BENTONITE SLURRY DEWATERING;
LEVEE CUT OFF WALL PROJECT

WHAT PERMITS APPLY

2022 STORMWATER CONSTRUCTION GENERAL PERMIT ATTACHMENT J

NPDES PERMITS;

- LOW THREAT DISCHARGES TO LAND
- LIMITED THREAT DISCHARGE TO
SURFACE WATER
- VOC'S & FUELS GROUNDWATER PERMIT
- GROUNDWATER PERMITS

401 WATER QUALITY CERTIFICATIONS

MS4 PERMITS

PUBLIC TREATMENT WORKS / LOCAL SANITATION DISTRICT

IRRIGATION DISTRICT



WHAT PERMITS APPLY

2022 STORMWATER CONSTRUCTION GENERAL PERMIT (CGP) ATTACHMENT J

Uncontaminated stormwater, groundwater and certain authorized non-stormwater discharges are allowed under the CGP

Dischargers with dewatering activities not subject to a separate NPDES permit are subject to the numeric action levels required in Attachment J

Need to test dewatering once a day within the first hour of discharge

- pH needs to be between 6.5 to 8.5
- Turbidity needs to be under 250 ntu
- Be aware of receiving water limits that may apply if discharging to a receiving water

WHAT PERMITS APPLY

401 WATER QUALITY CERTIFICATIONS

Very strict water quality objectives

Read your individual 401 permit carefully

Read project specifications as well

Authorizes diversions and surface water dewatering

Be very careful with groundwater, this is a separate water source that may be subject to other permits



WHAT PERMITS APPLY

SOURCES TO CHECK FOR PERMITS

- Read your project specifications
- Talk with your local Regional Water Quality Control Board
- Contact the MS4 or local City or County who owns the storm drain system you want to discharge to
- Contact your local sanitation District

TYPICAL DEWATERING METHODS

Dewatering to land

Dewatering under your 401 permit

Dewatering to a POTW or sewer manhole

Collection in a Baker tank for testing and offhaul

Dust control reuse

Passive Treatment methods

Treatment system methods



TYPICAL DEWATERING METHODS

RIVER SYSTEM DEWATERING WELLS

**Example: Russian River Fish
Ladder project**

**This system had multiple
Vertical dewatering pumps
inside of PVC pipes. Dewatered to
an adjacent water holding ponds.**

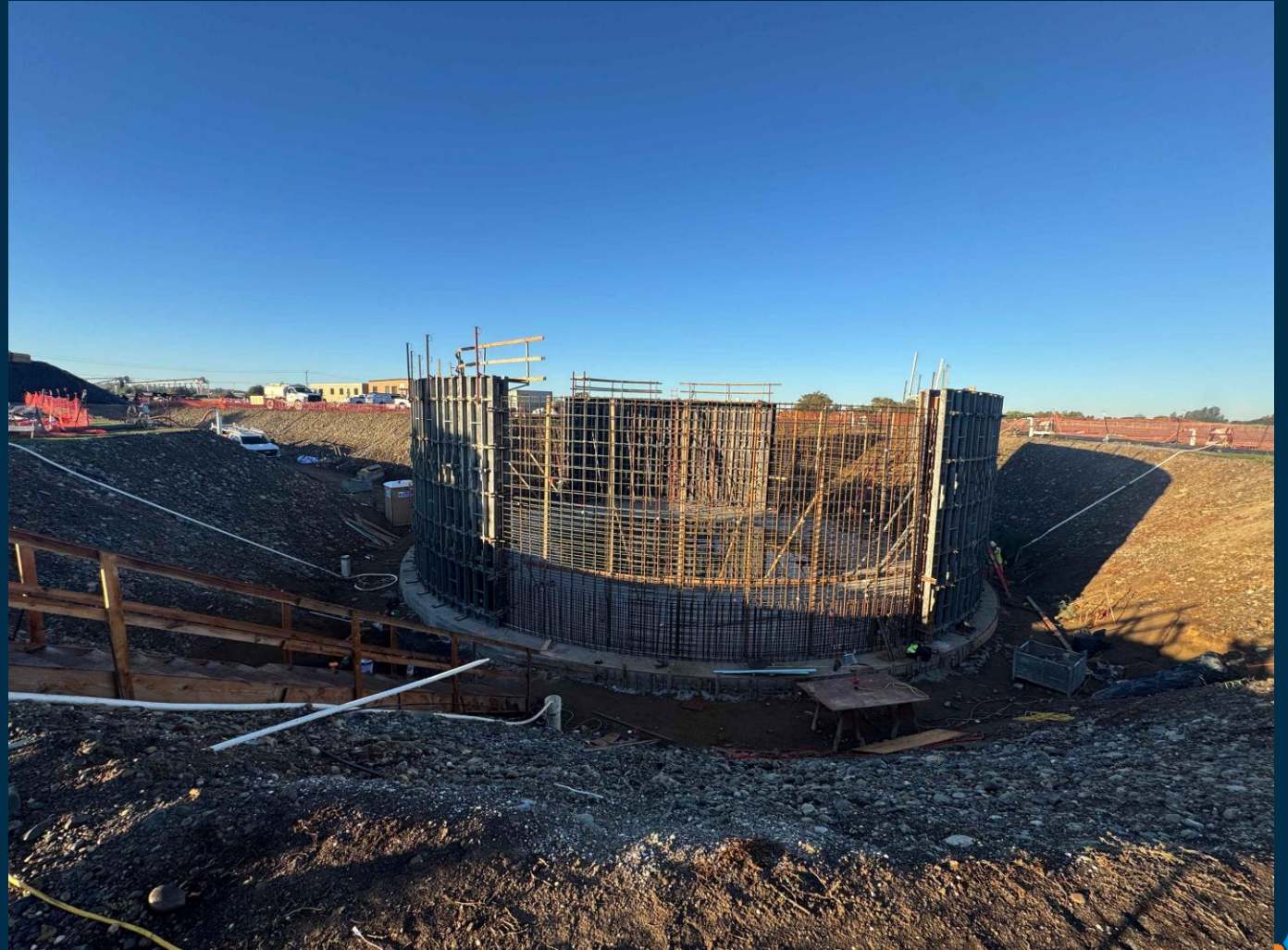


TYPICAL DEWATERING METHODS

DEEP EXCAVATION DEWATERING WELLS

**Example: Oroville WWTP
Upgrades project**

**This system had multiple
Vertical dewatering pumps
inside of PVC pipes. Dewatered to
a grassy field inside of the WWTP
under a Low Threat Discharge
Permit from the Central Valley
RWQCB.**



TYPICAL DEWATERING METHODS

SURFACE WATER DEWATERING

Example: Geyser's Rd Bridge project

This system had dewatering pumps inside the diversion area to alleviate seepage coming from the under the cofferdams. Dewatered to a Baker tank for testing and disposal. Used the 401 permit for clean water.



TYPICAL DEWATERING METHODS

TRAPPED SURFACE WATER AND STORMWATER

Example: Bridge Rehabilitation Project

This system had a diversion in place and there was trapped water inside the diversion area.



TYPICAL DEWATERING METHODS

Used a small pump which routed the water into a Baker tank for settling and testing.

Dewatered into a grassy area.



TYPICAL DEWATERING PLAN

Defines project scope, water quality in daily volume and max flow rate in GPM

Defines water source and water discharge method

Describes the treatment train

Describes monitoring protocols

Contains system details – get from your Treatment System provider

Reference relevant discharge permits

DEWATERING PLAN
for
FULTON RD SEWER MAIN IMPROVEMENTS WEST 3RD ST
TO SANTA ROSA CREEK

Prepared for:

City of Santa Rosa
69 Stony Circle
Santa Rosa, CA 95401
707-543-3800



Project Site Address

Along Fulton Road from West 3rd Street to Santa Rosa Creek
in Santa Rosa, Sonoma County, CA 95401

Approximate Coordinates: 38.440117, -122.769580

Prepared by:

Tully Consulting Group
1650 N. Lincoln St., Suite A
Dixon, CA 95620
707-693-1926

Robin Tully, PE, President
TCG Project Number: 26195



Date

7/16/2026



DEWATERING FIELD OPERATIONS

EXPERIENCED FIELD EXECUTION

Responsive Service



BUILDING THE DEWATERING SYSTEM

Turning the plan into an operating field system

Well Installation

Drilling, casing, screen and filter pack

Pumps & Controls

Pump selection, power, flow rates and system controls

Conveyance

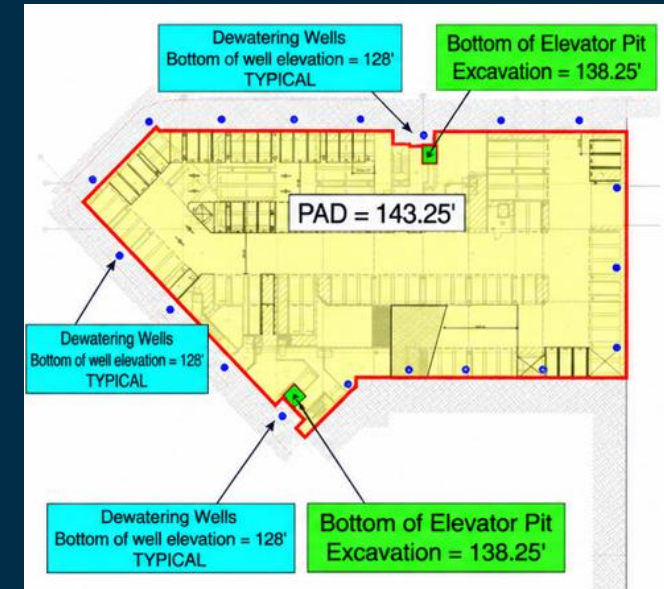
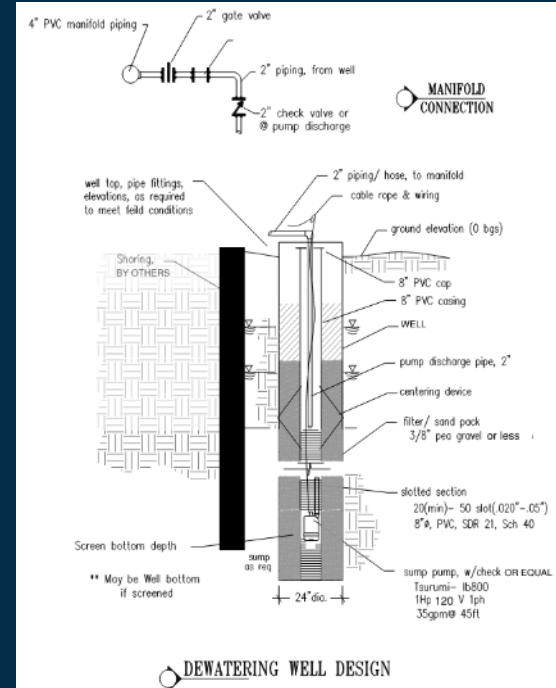
Header piping, hoses and routing water through the site

Treatment Setup

Positioning and connecting treatment equipment based on project requirements

Discharge Setup

Connecting the system to the approved discharge location



Treating the Water

Treatment is driven by site conditions & discharge requirement

Understand the Water

Sampling helps identify the type of treatment that is needed

Build the Treatment Train

Filtration and treatment equipment are selected based on project-specific needs

Adjust for Field Conditions

Treatment may need to change as groundwater conditions and construction activities change

Meet Discharge Requirements

The system must consistently produce water that meets the applicable discharge limits



Operating the System

Maintaining the system as construction progresses

Monitor the System

Track flow rates and equipment performance

Maintain Equipment

Weekly inspections ensure pumps, filters and other related equipment are operating properly

Respond to changing conditions

Be prepared to mobilize as site conditions or issues arise.

Keep Construction Moving

Maintain the dry conditions needed for work to progress



Monitoring & Response

Protecting the system around the clock

Automatic Safeguards

Automatic shutoff valves help prevent tanks from overflowing

Remote Alarm Monitoring

High-and-low level alarms alert the team when attention is required

Preventive Maintenance

Routine checks help identify problems before they cause a shutdown

24 / 7 Response

A dedicated response team will mobilize when equipment fails or problems occur





Stormwater Dewatering

Timely response to rain events

Removing Accumulated Stormwater

Pumping water from active construction sites to support recovery from precipitation events.

Manage Stormwater Discharge

Assess site conditions and determine whether water can be discharged directly, requires settling, or needs additional treatment



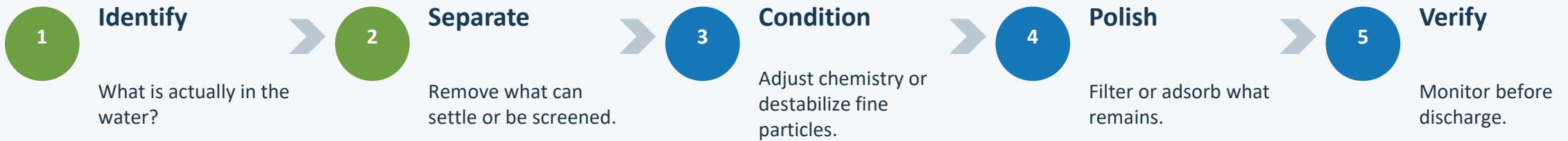
STORMWATER TREATMENT

Match the treatment to the constituent

Stormwater Awareness Week • Educational Overview

Start With The Water, Not The Equipment

A treatment train works best when each step targets a specific problem.



Key idea

Water treatment is usually a sequence — settling and solids removal do the heavy lifting; filtration and specialty media are most effective as downstream polishing steps.

Common Constituents Drive Different Treatment Choices

Suspended Solids / Turbidity

Sediment, clay and fine particles

Typical tools: Settling • filtration • coagulation/flocculation

pH

High or low pH from site conditions or materials

Typical tools: pH adjustment • controlled mixing • monitoring

Oil / Hydrocarbons

TPH and other petroleum-related compounds

Typical tools: Separation • organoclay • activated carbon

Dissolved Contaminants

Metals, VOCs, SVOCs, PFAS/PFOA and other dissolved constituents

Typical tools: Activated carbon • ion exchange • membranes / specialty media

Treatment selection depends on the constituent, concentration, flow, discharge criteria and site constraints.

Settling: Remove The Easy Solids First



Best for

- Settleable sediment
- High solids loading
- Protecting downstream filters

Why it matters

Ponds, basins and tanks give particles time to fall out. Pulling clearer water from the surface reduces the load on the next treatment step.

Mechanical Filtration: Capture What Settling Misses



Sand filters

Approx. 25 micron with #20 pool sand in the source material; media can be backwashed.

Bag filters

Available in multiple micron ratings; high sediment loading can consume bags quickly.

Coagulation + Flocculation: Make Fine Particles Removable

WHY FINE CLAY STAYS UP

Very small particles can remain suspended because of their small mass and repelling surface charges.

COAGULATE



FLOCCULATE



REMOVE

Destabilize particle charges

Build larger, heavier floc

Settle and filter the floc



Jar testing helps determine the appropriate chemistry and dose before full-scale treatment.

Passive Vs. Active Treatment

PASSIVE TREATMENT

Uses anionic polymer with other BMPs. The source material emphasizes combining polymer with sediment controls such as basins, filters and erosion-control BMPs — not polymer alone.



ACTIVE TREATMENT

Uses controlled coagulation/flocculation (or electrocoagulation) to reduce fine suspended sediment and/or control pH. The treatment train includes settling, filtration, continuous metering and controlled system response.



The distinction is not “simple vs. complex” — it is how treatment is applied, controlled and monitored.

pH treatment: chemistry needs control

pH is different from turbidity: you are changing water chemistry, not just removing particles.

Measure

Know influent pH and variability.

Dose

Add the selected pH-adjustment chemistry in a controlled manner.

Mix

Provide enough contact and mixing for the reaction.

Verify

Confirm pH before discharge; automate response where required.

Important: treatment limits and monitoring requirements depend on the applicable discharge pathway and permit.

Specialty Media: Target Dissolved Contaminants



Granular Activated Carbon (GAC)

Used as specialty media for dissolved organic contaminants such as VOCs and other organics.

Organoclay / OMZ

A specialty media option identified in the source material for hydrocarbon-related treatment trains.

Ion-Exchange Resin

Targets selected dissolved ions/metals depending on resin chemistry and water quality.

These media are usually protected by upstream solids removal, so their capacity is spent on the target constituent — not dirt.

Membranes: When Dissolved Material Must Be Separated

The source material identifies ultra/nano filtration and reverse osmosis as treatment options for dissolved constituents.

PRETREAT

Remove sediment and protect the membrane.

MEMBRANE

Separate constituents by membrane selectivity and pressure.

MANAGE

Plan for concentrate/reject water and cleaning.

VERIFY

Confirm treated-water quality before discharge or reuse.

Membranes are not a substitute for pretreatment — they are a downstream tool when the target is truly dissolved.

Monitoring Is Part Of The Treatment System



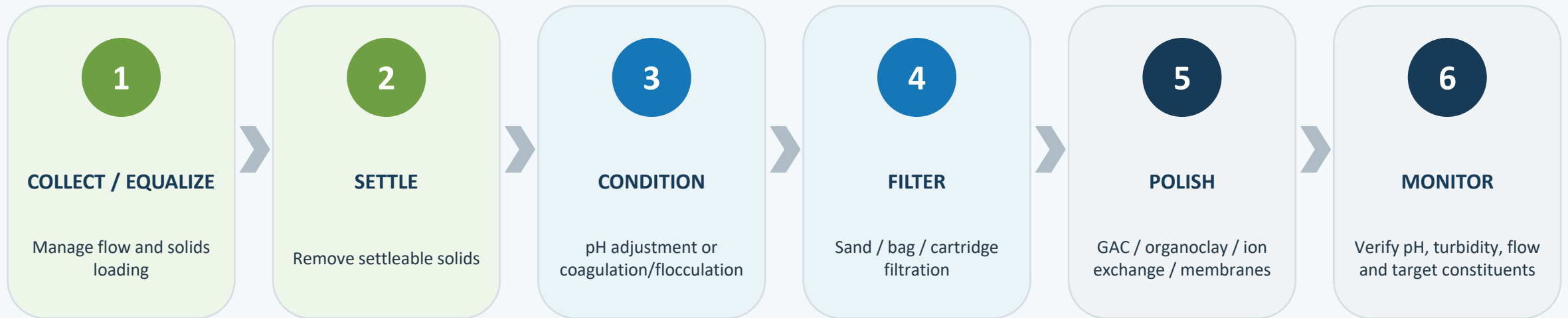
Inline monitoring

- pH
- Turbidity (NTU)
- Flow

System response

Monitoring should inform operations — including recirculation or shutdown when treatment is outside the intended range.

A Practical Treatment Train



The exact train changes with the water. Start with characterization, use the least intensive effective step first, and protect downstream polishing media.



Treatment Selection: Quick Reference

Constituent / Condition	Common Treatment Approach	Core Concept
Settleable solids	Settling / basins / tanks	First-line solids removal
Fine suspended solids / turbidity	Filtration; coagulation + flocculation when needed	Build larger particles, then remove them
pH	Controlled pH adjustment	Dose + mix + monitor
Oil / hydrocarbon-related constituents	Separation + organoclay / GAC	Protect media with upstream solids removal
Dissolved organics	GAC / specialty media	Adsorption / polishing
Dissolved ions / metals	Ion exchange / specialty media	Media chemistry must match target
Dissolved salts / selected dissolved constituents	Nano / RO where appropriate	Requires pretreatment and concentrate management

Characterize → select → treat → monitor → adjust



QUESTIONS?



Robin Tully



Robin@tullygroup.com
(707) 628-4219



Ric Campos



Ricci.campos@apexcoss.com
(510) 773-5461



Spencer Davis



sdavis@ats-env.com
(916) 316-7340