

Greensand WTP Expansion Project

January 28th , 2020

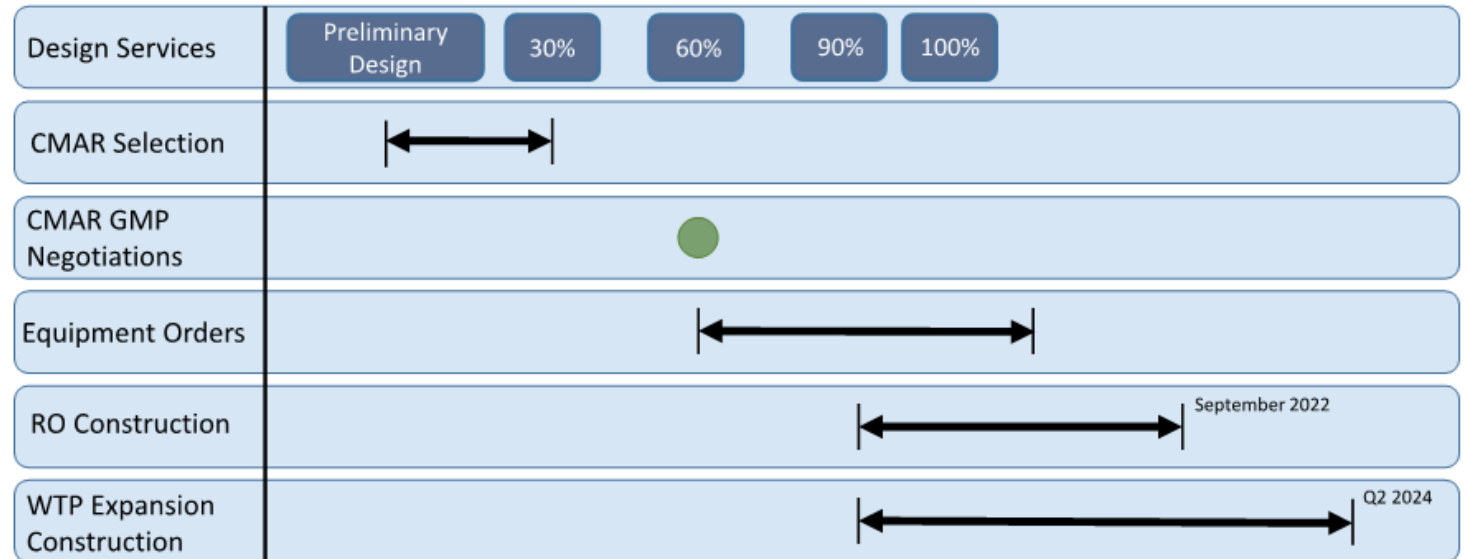


Project Details – Design Scope of Services

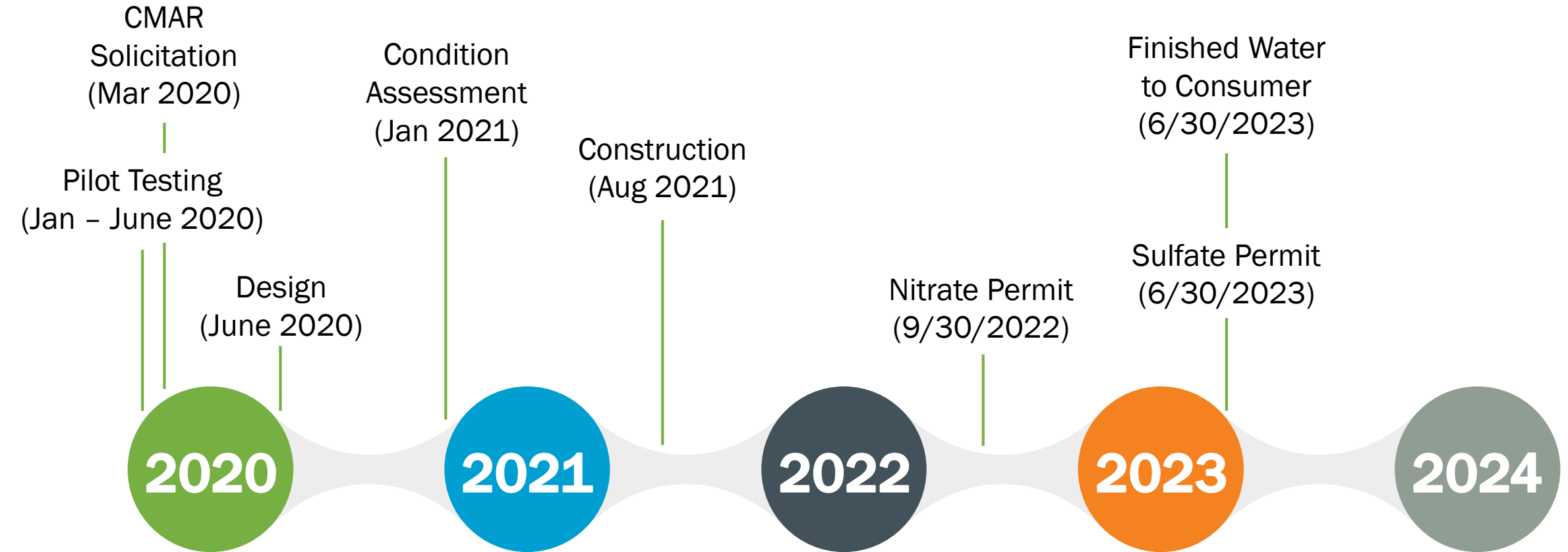
- **Phase I Scope of Services**
(Approved 9/3/19)
 - Pilot Testing
 - Water Quality & Process Evaluation
 - CDPHE Permitting
 - Conceptual Design
 - Condition Assessment
 - Hydraulic Evaluation
 - CMAR Solicitation
- **Phase II Scope of Services**
(At later date)
 - Opinion of Final set of construction documents
 - All permits and required easements
 - Engineers probable cost
 - Final set of specifications
- **Phase III Scope of Services**
(At later date)
 - Construction oversight and inspections services
 - Final acceptance testing
 - As-builts
 - Start-up and commissioning

Project Details – Overall Project Schedule

- Design engineer will be retained from conceptual planning through final construction completion (Phase I, II, & III)
- Retain CMAR (Construction Manager At Risk) for construction services (around 30% design)
- GMP (Guaranteed Maximum Price) will be established with CMAR at 60% design allowing for long lead time equipment purchases
- Owners representative can be contracted at any time for design review



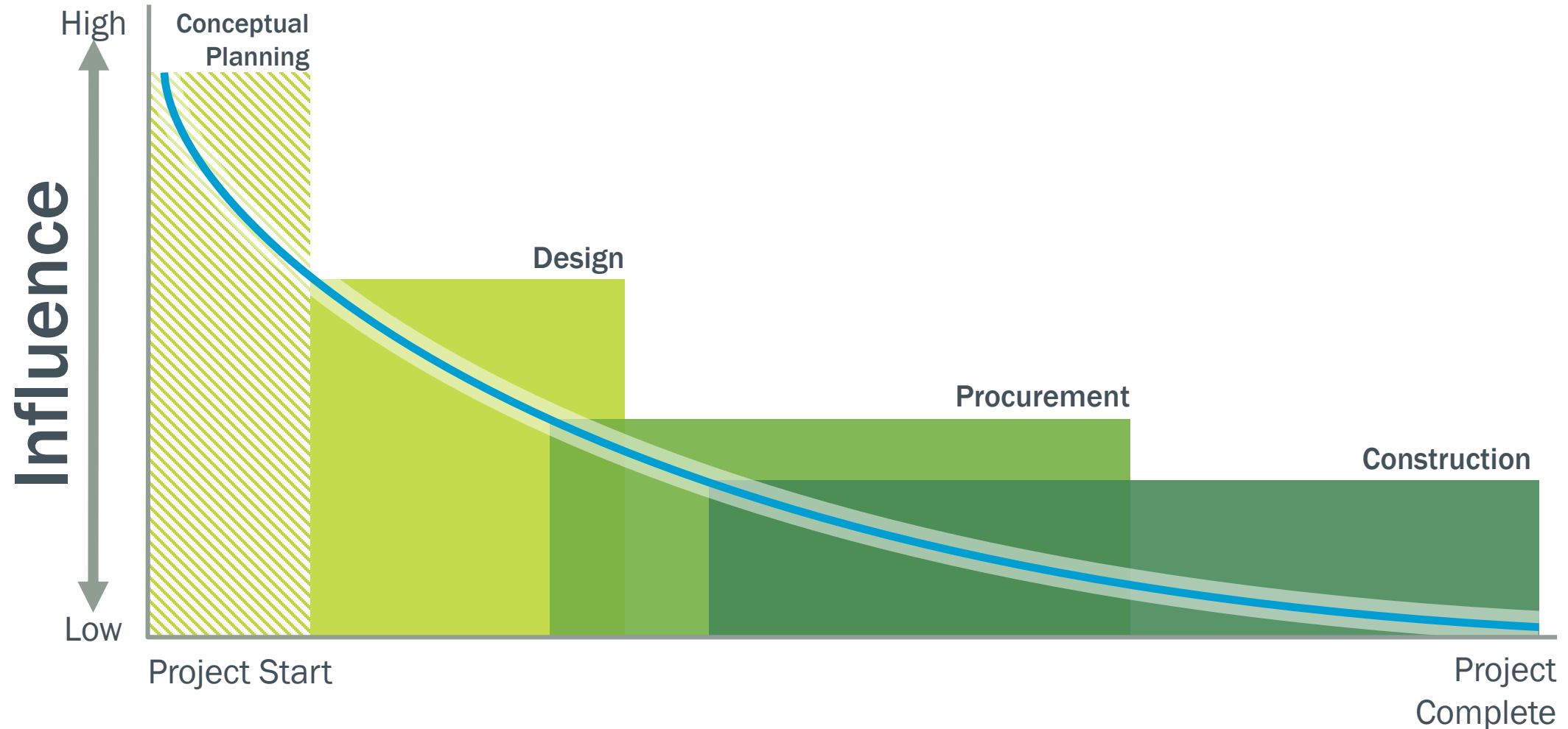
Project Overview



Iron & Manganese
Total Organic Carbon
Operability Process Reliability
Capital Cost Multiple Barrier Resilience
Disinfection Byproducts
Hardness Turbidity
O&M Cost Public Safety
Pathogens Water Quality
Nitrate



Impact of Pilot Testing



Brighton Source Waters

South Platte



Nitrate

Hardness

Organics

Beebe Draw



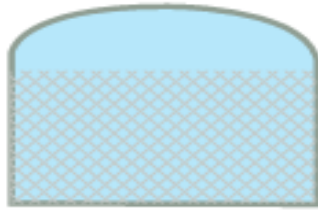
Iron & Manganese

Hardness

Organics

Pilot Treatment Train

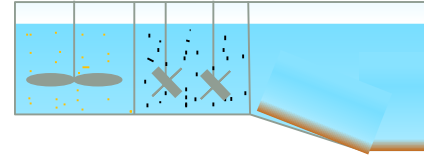
Biological Denitrification



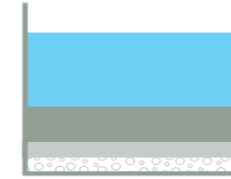
Pellet Softening



Pretreatment

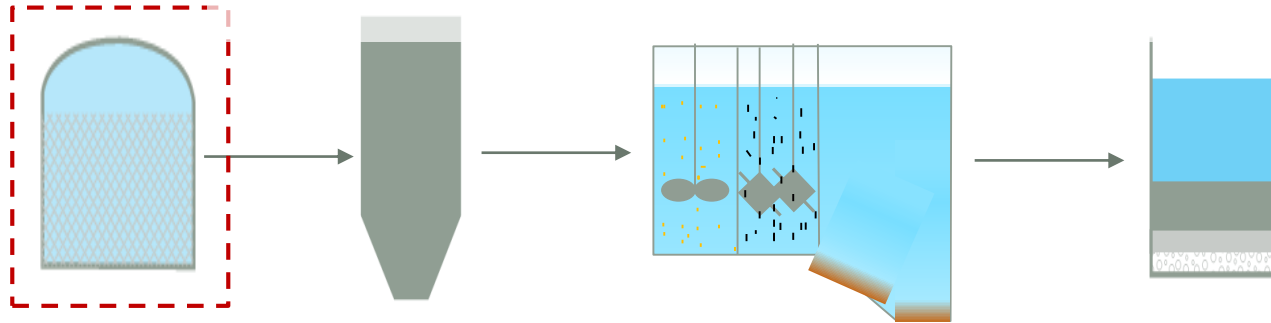


Media Filtration



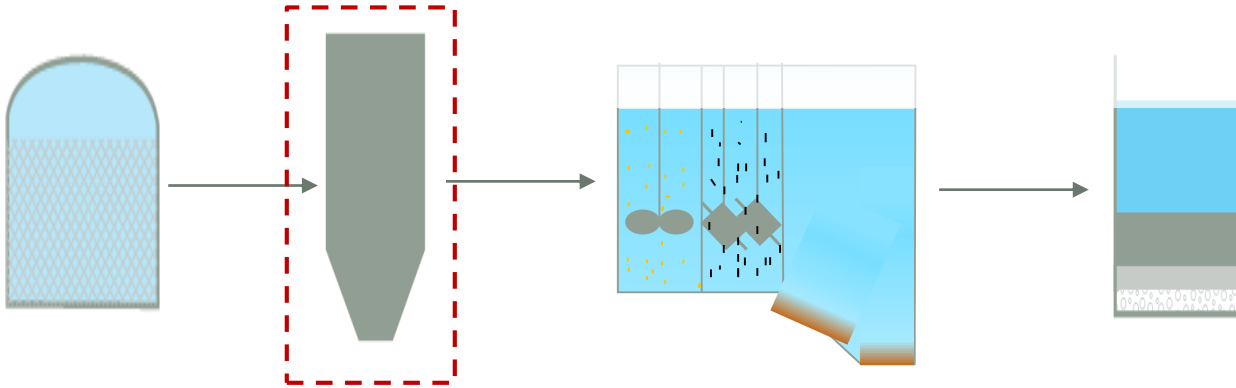
Biological Denitrification Deep Bed Filters

- Nitrate Removal



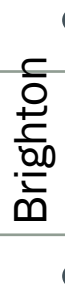
Pellet Softening

- Hardness Removal
- Iron & Manganese Removal



Hardness Treatment

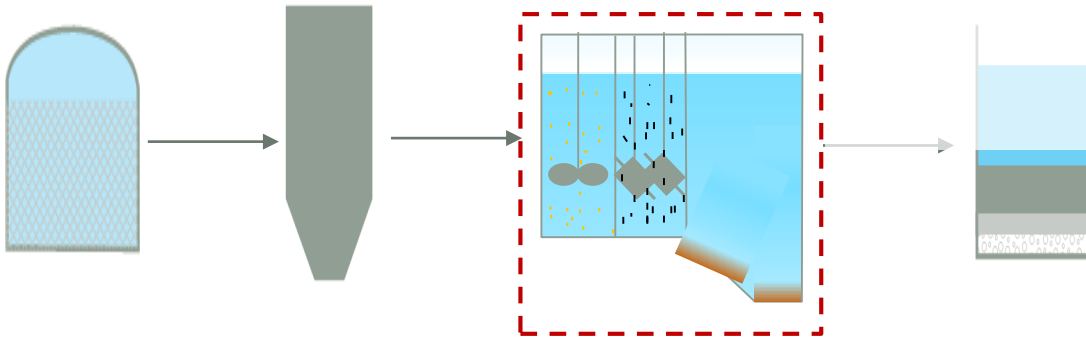
Classification	Hardness (mg/L as CaCO ₃)	Impact
Soft	0-100	No effect
Slightly Hard	100-150	Minimal scaling
Moderately Hard	150-200	Slight spots/scaling on dishes
Hard	200-300	Scaling on water appliances (i.e. sinks, tubs, faucets)
Very Hard	300+	Mineral buildup in pipes



The diagram shows a vertical scale labeled "Brighton" with two dots. The top dot is at the boundary between "Slightly Hard" (100-150) and "Moderately Hard" (150-200). The bottom dot is at the boundary between "Moderately Hard" (150-200) and "Hard" (200-300). Three stars are positioned to the right of the scale, aligned with the boundaries between the first four classifications.

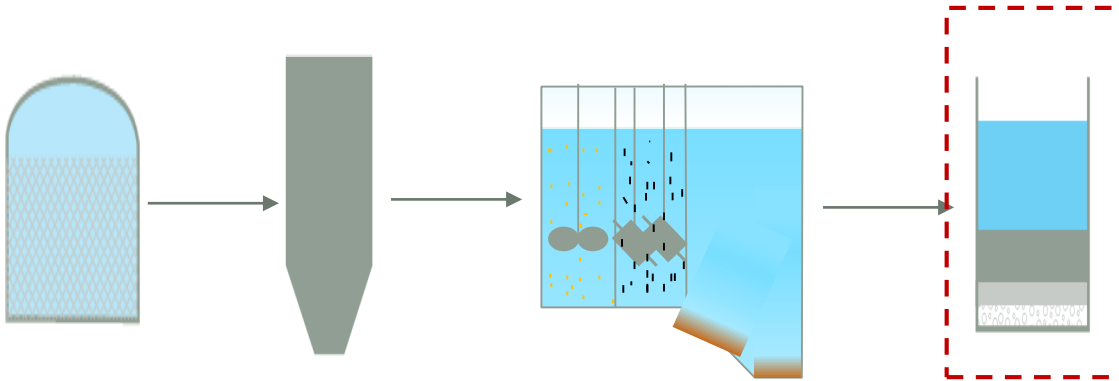
Pretreatment- Intuitech

- Organic Removal
- Hardness Removal



Media Filtration - Intuitech

- Microbial Barrier
- Iron and Manganese Removal



Public Outreach



Be informed



Stay educated



Be transparent



Thank you.
Questions?