GOULDS PUMPS
An ITT Brand

Goulds 3298

Municipal Chemical Pump

Municipal Water Treatment

Most municipal water is supplied from water sources such as large wells, reservoirs, rivers or lakes. Dirt, debris, and biological agents that may be toxic, and cause water to taste and smell bad must be removed to meet regulatory requirements. Generally, municipal water goes through three steps:

1. Sedimentation and Flocculation

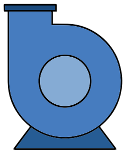
The influent is screened then held to allow the settlement of solids to the bottom of a holding tank or reservoir. Further clarification is accomplished though the introduction of coagulation agents that bind solids that do not settle.

2. Filtration

Water is passed through gravel and sand filters which remove the smallest particles and some pathogens.

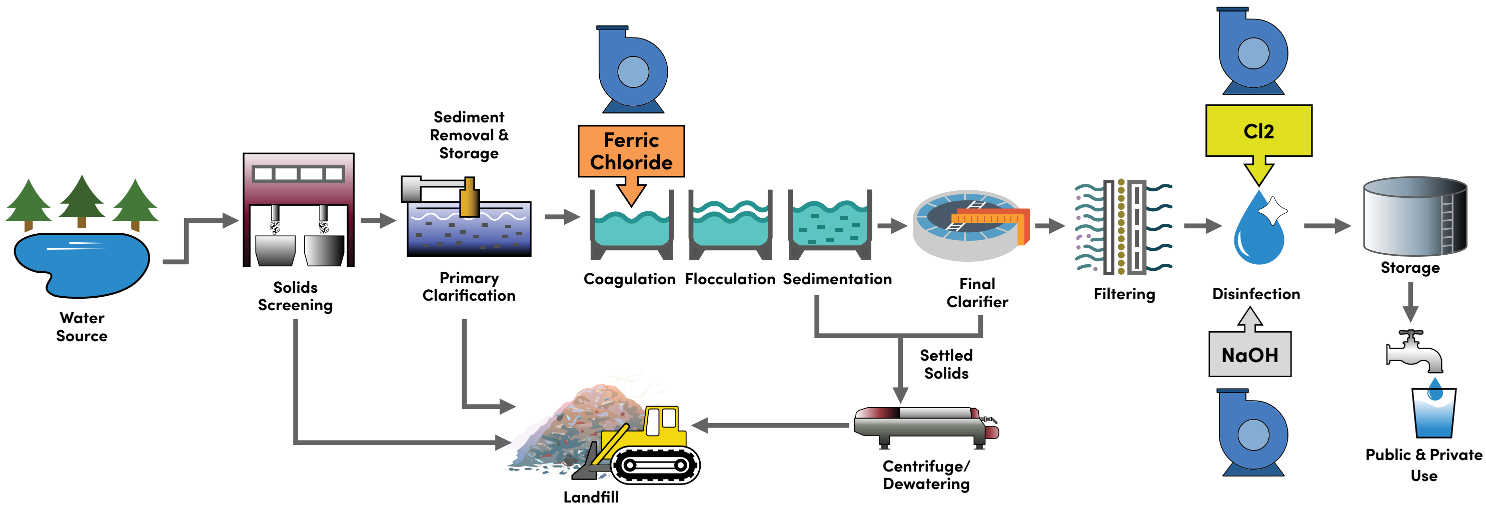
3. Disinfection

Any remaining pathogens are killed through disinfection. Typically, this is accomplished by introducing chlorine (Cl2), sodium hydroxide (NaOH) and other chemicals.



Look for the blue pump symbol in the following process flow diagrams to identify where corrosion resistant pumps are used. The fluoropolymer (ETFE) lined, magnetically driven 3298 is ideally suited to these applications due to its corrosion resistance and leak proof construction.

Common High-Level Water Treatment Process Flow



Wastewater Treatment

Most municipalities are not only responsible for supplying clean water for public use, but are also responsible for treating wastewater before returning the effluent to nature. The steps for this are similar to producing water for use.

1. Screening, Processing and Sedimentation

Raw sewage is screened to remove solid waste. The effluent is then ran through a comminutor to break up hard material. Solids in suspension are settled within the grit chamber and aeration tanks. The resulting solids are typically sent to a landfill.

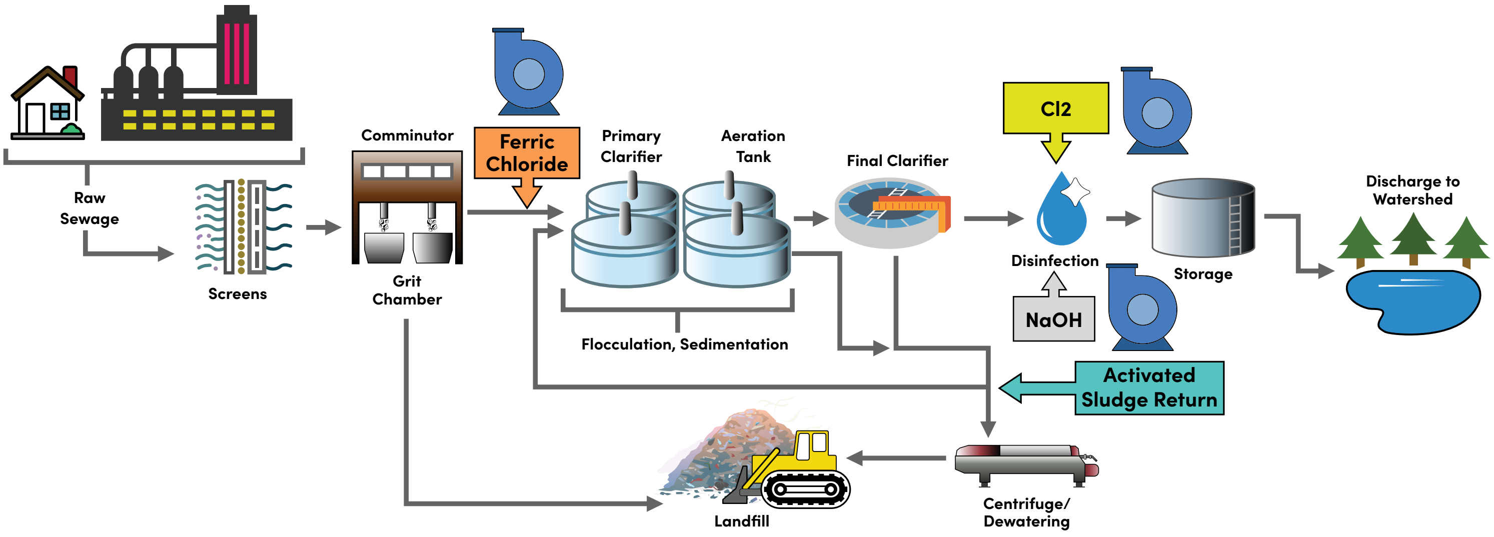
2. Clarification

The effluent is sent through a series of clarifiers which add flocculants for separation as well as biotics that consume the waste. The activated sludge is accumulated at the bottom of the clarifier and sent back to the start of the process. Ferric Chloride is often used between stages to remove phosphorus.

3. Disinfection

The effluent, now cleared of solids is disinfected and held in large tanks so the concentration of chlorine and other chemicals are reduced. The clean water is released back into local lakes or rivers.

Common Wastewater Treatment



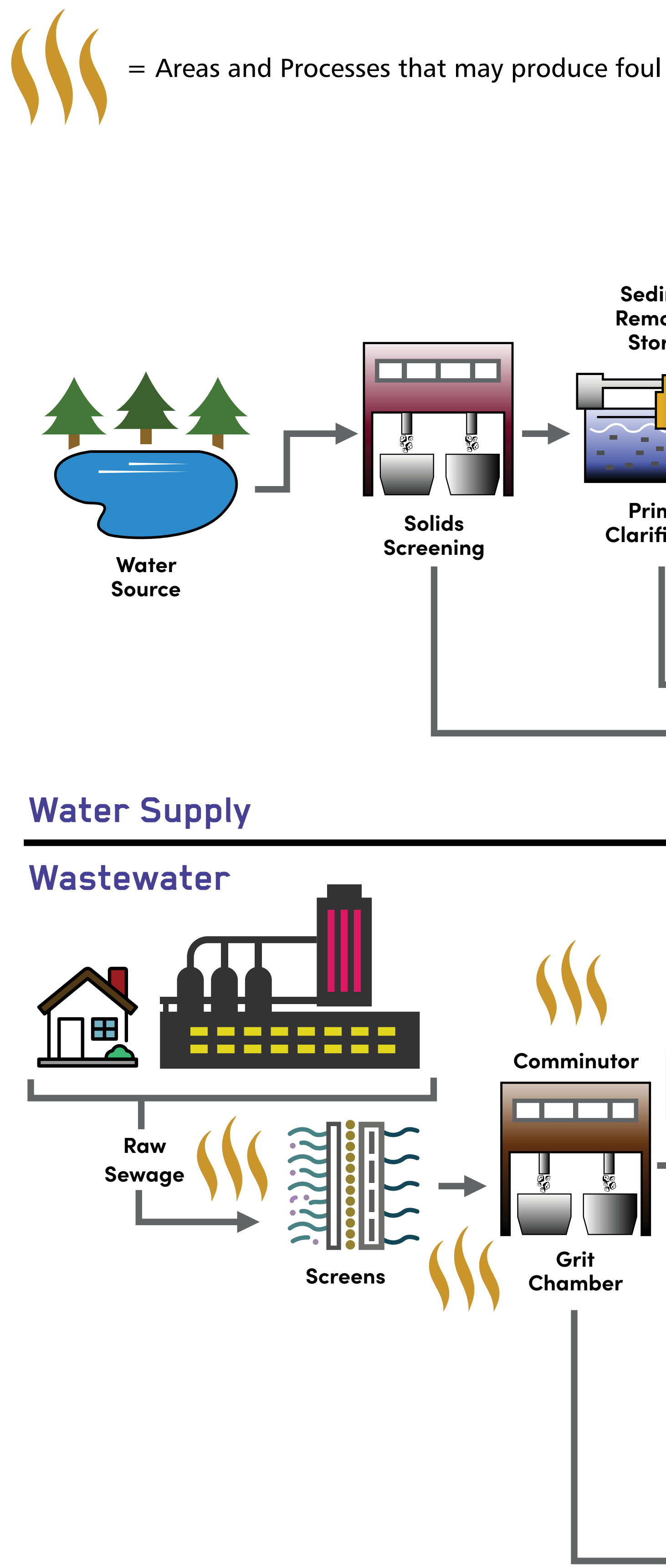
Wastewater Treatment Odor Control

Municipalities that fail to take proactive action to control odors run the risk of alienating themselves from the community and may face harsh penalties. This is especially true as urban areas expand into the once remotely located water treatment facilities.

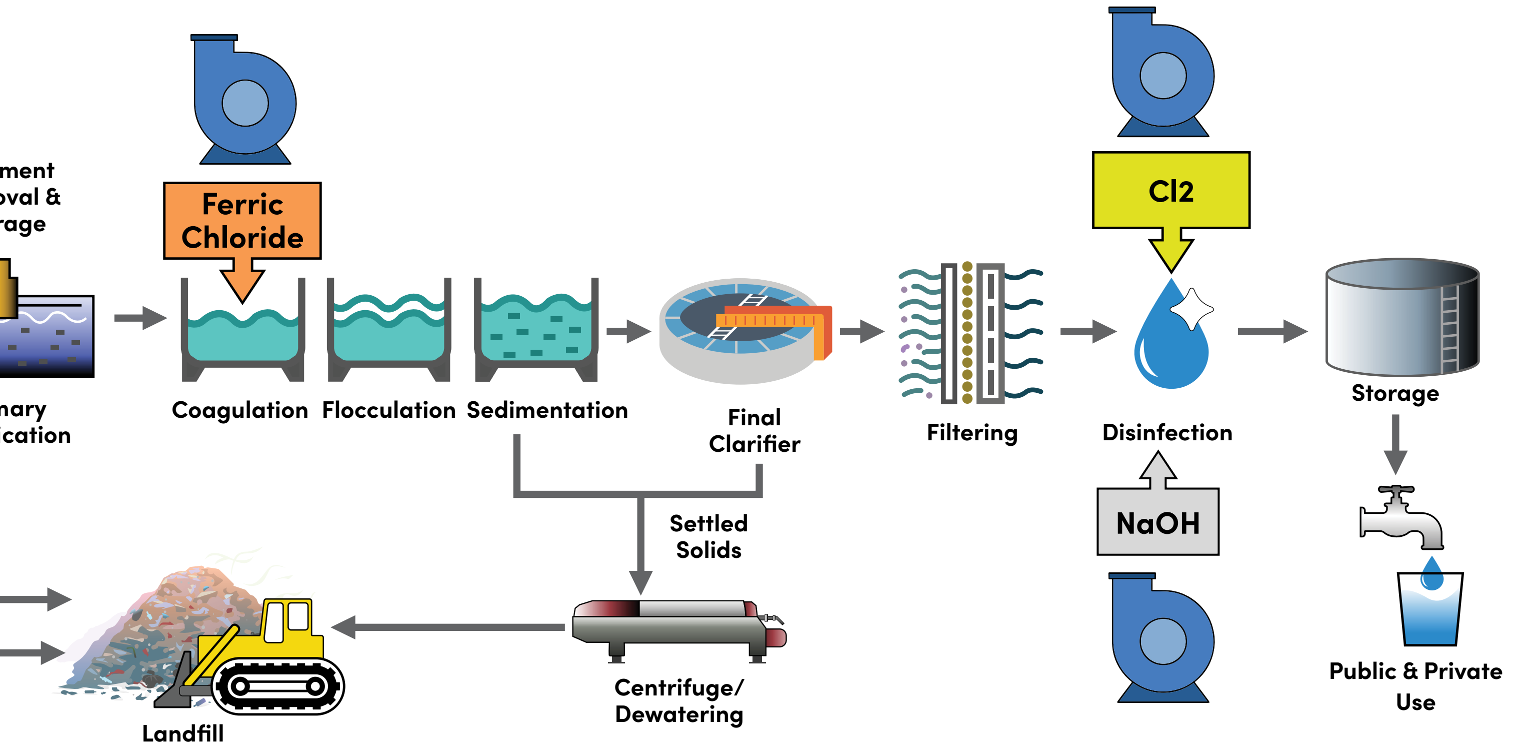
Odors are caused by the bacteria used to consume raw waste as well as other treatment processes. As bacteria break down organic solids, they release sulfate ion (SO2-4) as the oxygen source for respiration, producing hydrogen sulfide (H_2S) which causes the offensive rotten-egg odor. H_2S is also highly corrosive.

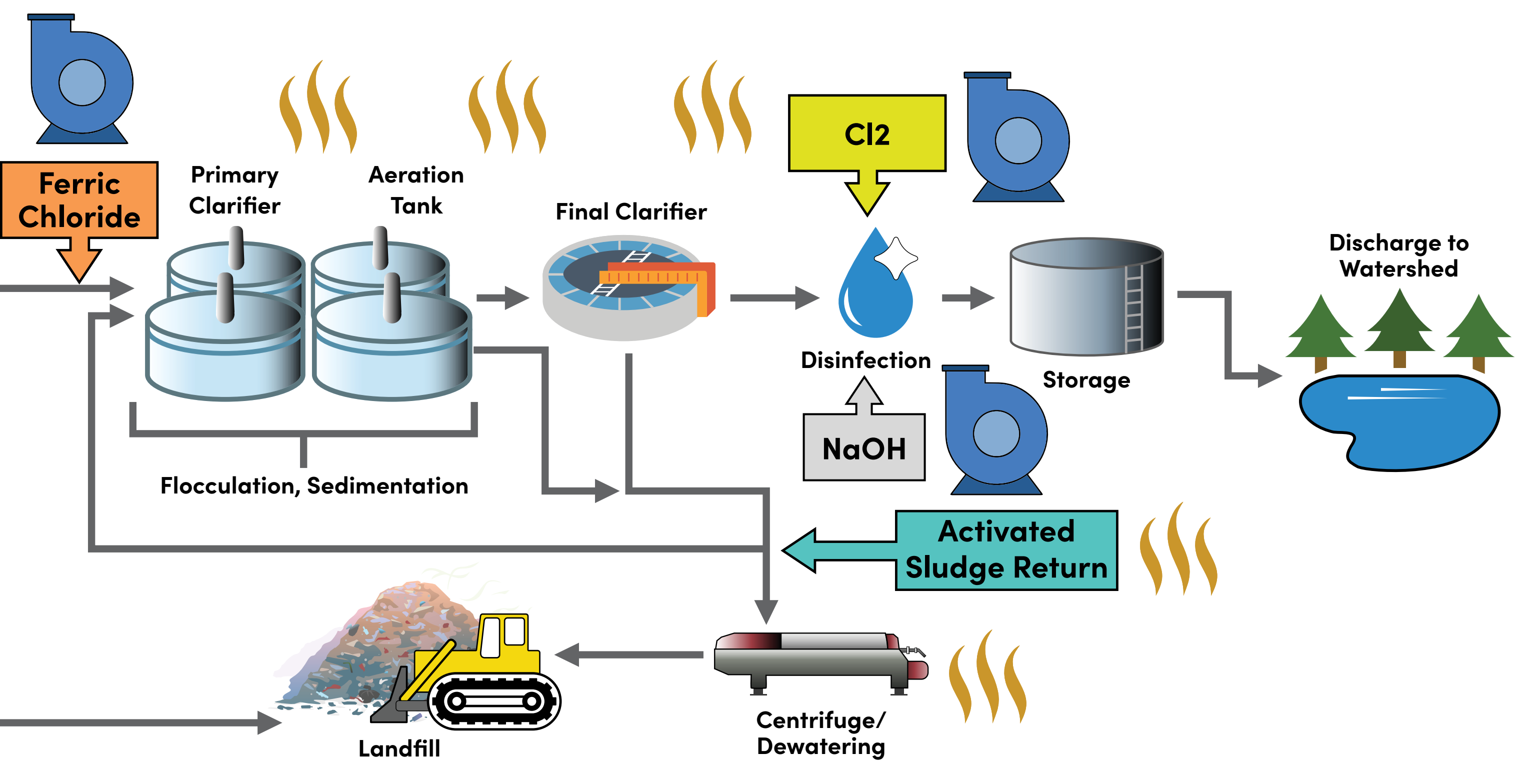
Areas of water treatment facilities that potentially release strong odors include the following:

- Headworks (sewage)
- Activate Sludge Handling (both influent and effluent sides)
- Clarifiers
- Sediment Basins
- Lagoons/Holding Tanks
- Biosolid Treatment Processes
- Septage Dumping



odors


Ferric Chloride
Coagulation
Flocculation
Sedimentation
Final Clarifier
Filtering
Cl2
Disinfection
NaOH
Storage
Public & Private Use
Settled Solids
Centrifuge/ Dewatering
Landfill


Ferric Chloride
Primary Clarifier
Aeration Tank
Flocculation, Sedimentation
Final Clarifier
Cl2
Disinfection
NaOH
Storage
Discharge to Watershed
Activated Sludge Return
Centrifuge/ Dewatering
Landfill

Odor Control Methods

Depending where odors occur, there are two groups of technologies used in odor mitigation: Vapor-Phase and Liquid-Phase. There are many technologies; but the focus here is where corrosion resistant pumps may be needed.

Vapor-Phase

Most odors are mitigated by sealing/covering basins and biological and chemical solutions.

Wet scrubbing systems use sodium hypochlorite (NaClO a.k.a, bleach) or NaOH (both chemicals are highly corrosive to metals) circulated into the system chemically modifying sources of H2S.

Liquid redox technologies typically used in the oil and gas industries to remove H2S from hydrocarbons are being more widely adopted by larger municipalities, but are still somewhat rare due to the high capital expense. The process uses chelating agents as a catalyst to speed up natural processes that convert H2S into solids. The process requires corrosion resistant materials.

Biofiltration is less costly but cannot remove nitrogen-based ammonia and amines.

Scavenger systems use chemicals to remove gas and liquid sulfer compounds by reacting/converting them into less offensive compounds. Often, corrosion resistant materials are used in this process.

Liquid-Phase

Iron salts (ferric chloride or Iron(III)) can be introduced at key points in liquid processes to oxidize and precipitate sulfides. This results in ferrous sulfides which can be used downstream to remove phosphorous, serving a dual purpose. Handling Iron(III) requires corrosion resistant materials.

Bioxide and Anthraquinone are also introduced to react with H2S, but do so less efficiently. The upside is they are less hazardous.

Strong oxidizing agents like Hydrogen Peroxide (H2O2) are corrosive but effective in eliminating odors from H2S. These processes require corrosion resistant materials.

As with Vapor-Phase odor control, the capital-intensive liquid redox technology is also effective as part of digester gas treatment processes.

Ideal Chemical Pump

The Model 3298 is an ideal chemical pump for Municipal Services:

Corrosion Resistance:

- Tough Flouropolymer ETFE lining resists almost all corrosive chemicals and is permanently bonded to the substrate ductile iron
- Users get all the chemical resistance without the high cost of corrosion resistant metals like Super Duplex Steel, Hastelloy, and Titanium

Close Coupled Construction:

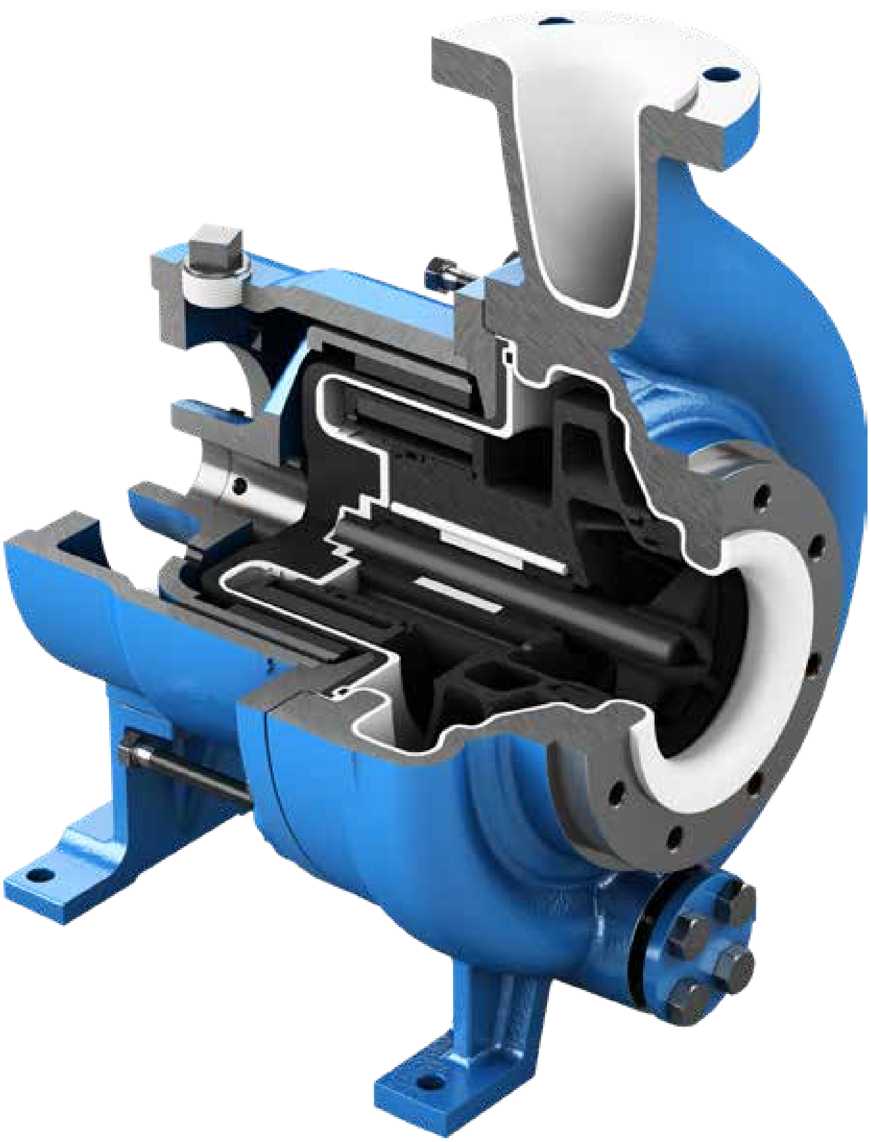
- The pump can be located in confined areas where space is at a premium
- No need to worry about alignment

Sealless Construction-No Worries:

- No need to worry about finicky and difficult to maintain and expensive mechanical seals and seal plan systems
- No need to worry about leaks. The 3298 is leakproof!

Maintainability:

- The Model 3298 has few parts and is easy to maintain
- Optional DryGuard® bearings, power monitoring and leak detection protect the pump from common failure modes
- Quick and reliable parts availability all over North America



In Addition to the 3298, There is a Goulds Pump for a Wide Range of Municipal Applications

3196
General Service ANSI pump

CV3196
Recessed Impeller Solids Handling

NM3196
Non-metallic Pump for Chemical Resistance

3198
Sealed Lined Pumps for Limited Solids Handling and Corrosion Resistance

3409/10/20
Double Suction for Higher flows

3171
Vertical Sump Pump

VIT
For Low NPSH and High Pressure Services

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