“A Wastewater Treatment Plant Start-up Guide and Some 2011 Plant Start-ups ”

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October 13, 2011

SEH

My Most Difficult Start-up
May 18, 1980 - 8:32 a.m.
Yakima, Washington

- Population 50,000
- 15.4 MGD Advanced Trickling Filter/Activated Sludge Plant
- Had just completed $24 million upgrade
- Operated WWTP 3 days before equipment failed and pipes plugged
- Bypassed all sewage to river for 4 days
- Clean-up at WWTP took 4 days, crews worked 24/7
- Plant was meeting effluent limits within 7-10 days

The streets of Yakima, Washington are dark at 3:00 PM that day. The dust stayed around for 6 weeks

Construction Projects are Complicated

- Several phases that can cover 2-3 years
  - Facility Planning, Funding, Starting Design, Regulatory Approvals, Equipment Startup, Operator Training, SOP's, O&M Manuals, One Year Certification
- There are many issues to deal with when performing start-ups.
  - Taking process trains out of service
  - Keeping the treatment plant operational from becoming upset and still meeting permit limits
  - Keeping sewage from backing up into basements during bypass events
  - Constructing or starting processes in wet or cold weather

Key Components to Successful Startups

- Have a startup plan that includes
  - A schedule that sequences equipment out of service
  - A list of all new equipment
  - Develop a certification page for manufacturer/ supplier/contractor and owner
  - Include the equipment specifications
  - Create an equipment startup schedule and prepare a calendar showing dates/times
  - Have submittals and O&M's at the job site
- Make the training interesting and interactive. Do a little in the classroom and a lot in the field
- Run equipment in manual, then let the operators switch to automatic mode when they are comfortable

715-387-8429

FAX NO. 715-384-4848

Sauk Centre WWTF

4390-11000 Start Up Manual

Final Completion Date: 10/31/11

Owner :

Sauk Centre WWTF
7 12th St South
Sauk Centre, MN 56378
Contact: Glen Bauer
Phone: 302-351-5693
Fax: 302-352-2833

Engineer:

Short Elliott Hendrickson, Inc.
1200 25th Ave S
St. Cloud, MN 56301-4806
Contact: Tracy Ekola
Phone: 320-229-4406
Fax: 320-229-4301

Jobsite:

Staab Construction Corporation
Sauk Centre WWTF
7 12th St South
Sauk Centre, MN 56378
Contact: Ron Twardowski
Jobsite Phone / Fax: 320-351-4229

Sauk Centre WWTF Start Up

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MANUFACTURER/SUPPLIER CERTIFICATE OF PROPER INSTALLATION/ START-UP / OPERATOR TRAINING

Project Name and/or Location:	**Sauk Centre WWTF, Sauk Centre, MN**		
Owner:	**City Sauk Centre**		
Engineer:	**Short Elliott Hendrickson, Inc (Tracy Ekola))**		
Specification No.:	**43-21-15**		
Equipment:	**Submersible RAW Sewage Pumps (3ea)**		
Manufacturer:		Serial No.:	

As a result of this inspection, operation and testing, we hereby certify the following: (please check or mark n/a where appropriate)

	Start-up has been completed.
	Operator has been trained to operate & maintain equipment.
	Specified spare parts have been furnished.
	Equipment conforms to the requirements of the contract documents.
	Equipment is ready for permanent operation by others.
	That nothing in the installation will render the manufacturer's warranty null and void.

Observations/Recommendations/Comments:

Manufacturer's Rep: Quality Flow Steve Loebermann	Signature:	Date:
Owner Rep: Roger Worm	Signature:	Date:
S.C.C. Rep:	Signature:	Date:

4. Cable holder: fabricate from 316 stainless steel and attach below pump access cover.
5. Furnish lifting chain for each pump.

B. Motor protection:
1. Design to detect water and over temperature in oil chamber and stator housing.
2. Send signal to stop motor and activate alarm when water is detected.
3. Provide protection module to Section 40 90 00 supplier for mounting in supervisory control panel.

C. Power Cables:
1. Size according to NEC and ICEA standards.
2. Length sufficient to reach junction box without the need of any splices.
3. Oil resistant outer jacket of chloroprene rubber.
4. Entry seal at motor:
   a. Single or dual cylindrical elastomer grommet, flanked by washers, all having a close tolerance fit against cable outside diameter and entry inside diameter and compressed by body containing a strain relief function separate from the function of sealing the cable.

C. Place all anchors in accordance with certified prints supplied by equipment manufacturer.

3.02 FIELD QUALITY CONTROL

A. Manufacturer's Field Services:
1. Inspect and approve final installation.
2. Perform all necessary calibration and adjustments in accordance with Manufacturer's Standard Recommended Start-Up Report Form.
3. Coordinate startup with installation of related equipment.

3.03 DEMONSTRATION

A. Provide eight (8) hours actual operator training at Owner's convenience after equipment is operational. Owner may videotape training.

END OF SECTION

SAUK CENTER, MN WWTF

Equipment Start Up Sign-In Sheet

Date	Name	Equip. Rep.	Time In	Time Out	Comments

staab construction corporation

1905 LAEMLE AVE., P.O. BOX 800, MARSHFIELD, WI 54449-0800
715.387.8429 FAX NO. 715.384.4848

EQUIPMENT START UP SCHEDULE

		grudie@staabco.com
S.E.H Representative	Roger Worm	(320) 250-10
		rworm@sehinc.com
Owner Representative	Glen Bauer	
		wastewater@scpuc.com

SCC Code	Spec Section	Equipment Description	Installation Complete	O & M Approved	Checkout / Startup		Training		Equipment Representative			
					# of Trips - Days	Installation Services Approved	Required Hrs	Instructional Services Approved	Company	Contact Person	Phone	Email
11307	43-21-15	Submersible RAW Sewage Pumps (3ea)			1day		8hrs		Quality Flow	Steve Loebermann	(612) 860-7840	steve@qfsi.n
11307	43-21-15	Submersible RAW Scum Pumps (2ea)			IA		IA		Quality Flow	Steve Loebermann	(612) 860-7840	steve@qfsi.n
14600	41-22-00	Davit Cranes			1day		IA		Quality Flow	Steve Loebermann	(612) 860-7840	steve@qfsi.n
11308	44-42-50	Rotary Lobe Pumps (2ea)			1day		8hrs		VESSCO	Tony Beyers	(952) 314-0616	tbyers@vessco.
11355	44-42-50	Fluid Detection System			1day		IA		VESSCO	Tony Beyers	(952) 314-0616	tbyers@vessco.
11311	43-21-05	Vertical Centrifugal Pumps (3ea)			1day		8hrs		WW Goetch	Brian Goehring	(952) 831-4340 x172	bgoehring@wwgoet
11314	43-21-13	Grit Pump			1day		8hrs		VESSCO	Tony Beyers	(952) 314-0616	tbyers@vessco
11320	44-42-39	Grit Removal System			1day		8hrs		VESSCO	Tony Beyers	(952) 314-0616	tbyers@vessco
11322	44-42-41	Grit Classifier			1day		8hrs		VESSCO	Tony Beyers	(952) 314-0616	tbyers@vessco
11332	44-43-33	Mechanical Fine Screen			1-3days		8hrs		Huber	Jackie Steele	(704) 949-1001	jackie@hhusa
11344	44-44-73	UV Disinfection			2days		4hrs		Engr America	Colleen Fischer	(651) 777-4041	cfisher@engamer
11345	44-44-13	Chemical Feed Equipment			1day		4hrs		Hawkins	Kim Putz	(612) 617-8637	kim.putz@hawkins
13208	44-44-14	Chemical Feed Tanks			1day		4hrs		Hawkins	Kim Putz	(612) 617-8637	kim.putz@hawkins
11352	44-46-26	DAFT Sludge Thickener			1day		4hrs		Westech	Dave Romer	(801) 290-1874	dromer@westech
11353	44-46-14	Circular Clarifier No 1		4/14/11	1-2days		4hrs		Walker Process	Helen Wexell	(630) 264-5402	hwexell@walker-pr
11353	44-46-14	Circular Clarifier No 2		4/14/11	1-2days		4hrs		Walker Process	Helen Wexell	(630) 264-5402	hwexell@walker-pr

May 2011

May 2011

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

June 2011

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
May 1 - 7	May 1	2	3	4	5	6	7
May 8 - 14	8	9	10	11	12 BYPASS SETUP	13	14
May 15 - 21	15	16	17 *Hoists 41-22-00 *Sampling Equip 43-22-[illegible] *Sampling Training (4hrs	18 *UV Startup 44-44-73 *UV Training (4hrs)	19	20	21
May 22 - 28	22	23	24	25	26 BYPASS INSTALLATION	27	28
May 29 - Jun 4	29	30 Memorial Day	31 *Fluid Detection 44-42-5 *Rotary Lobe Pumps 44-[illegible]	Jun 1	2	3	4

Some 2011 WW Plant Start-ups From Small to Largest

1. Brownton, MN
2. Renville, MN
3. Sauk Centre, MN
4. Cambridge, MN
5. Montevideo, MN
6. Bismarck, ND

Brownton, MN

- Population 784, no industry
- Current Average Daily Flow – 50,000-100,000 gal/day
- Project cost $0.55 million
- Plant upgrade due to aging equipment.
- Retrofit of old circular package plant with fine bubble diffusers, final clarifier, blowers and UV disinfection
- Something unique to this small City: They installed a wind turbine a few years ago


BROWNTON WASTE TREATMENT


P&H OMEGA

Renville MN

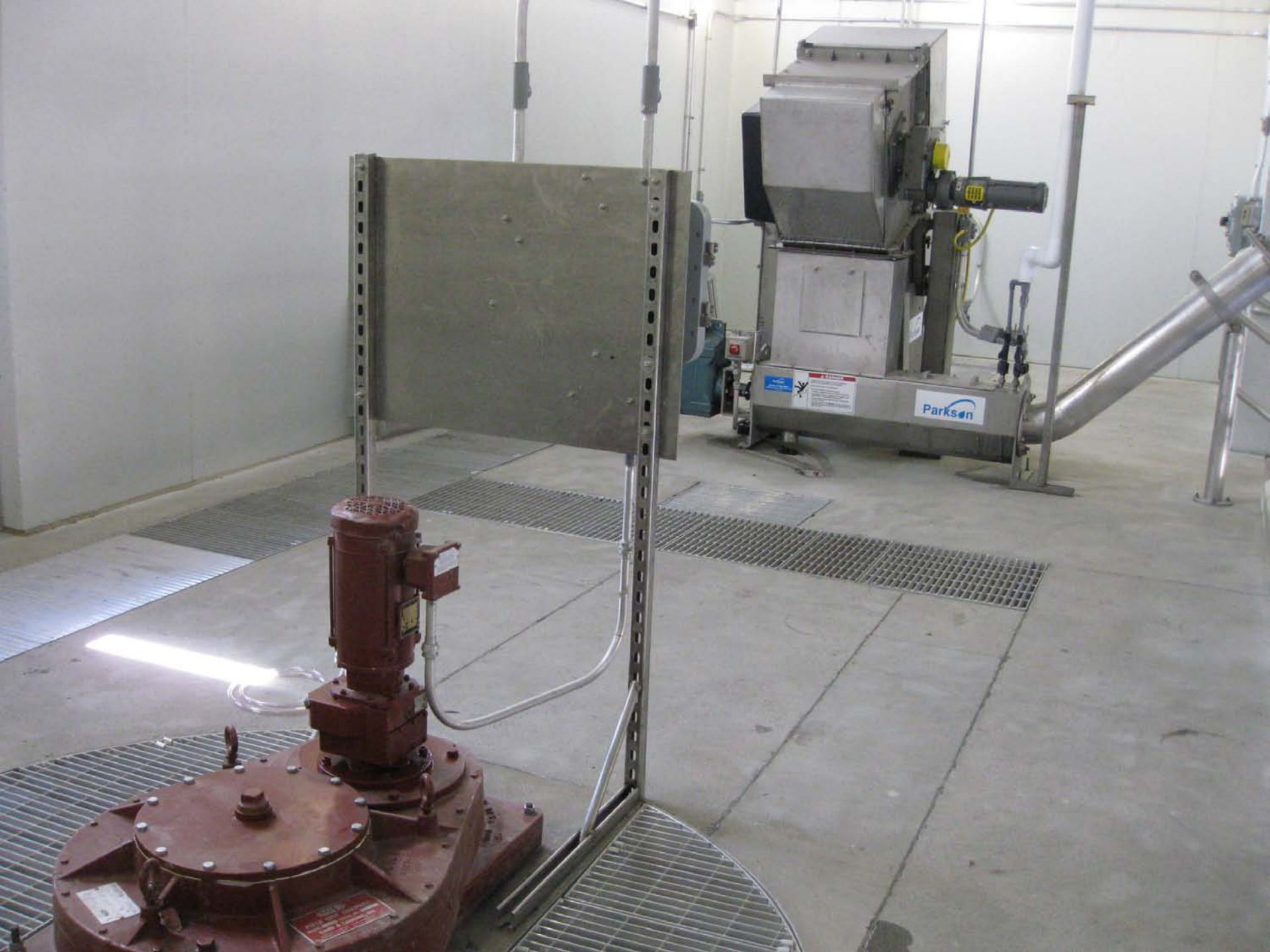
- Population 1,200 – “Cooperative Capital”
- Several Large Industries
  - Egg processor, Tilapia fish farming, Southern MN Beet Sugar
- Current Average Daily Flow – 0.50 to 0.90 mgd
- Project cost $4.0
- Plant upgrade due to phosphorus regulations on MN River and aging equipment
  - New pretreatment building grit & screening, activated sludge process aeration equipment, chemical feed system, sludge storage
  - Other miscellaneous improvements


JAN 8 2002


JAN 8 2002


Rex


Rex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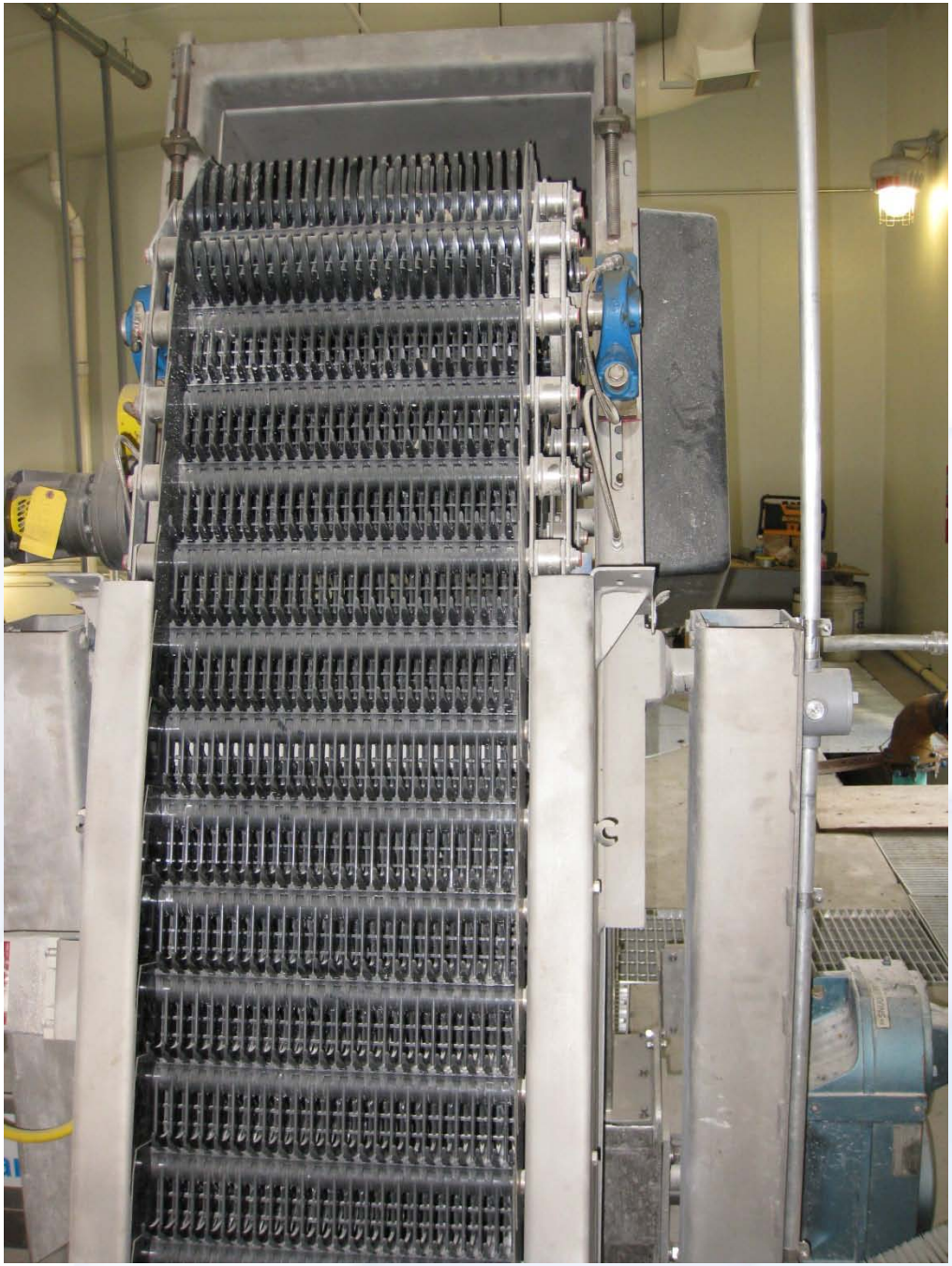


Sauk Centre, MN

- Population 4,061
- Current Average Daily Flow – 0.60 to 0.75 mgd
- Project cost $6.0 million
- Plant upgrade due to phosphorus regulations on Sauk River and aging equipment and structures
- Retrofit of old activated sludge moving bridge package plant with fine bubble diffusers, final clarifiers, grit removal, screening, DAF thickener, alum feed, sludge thickener and uv disinfection

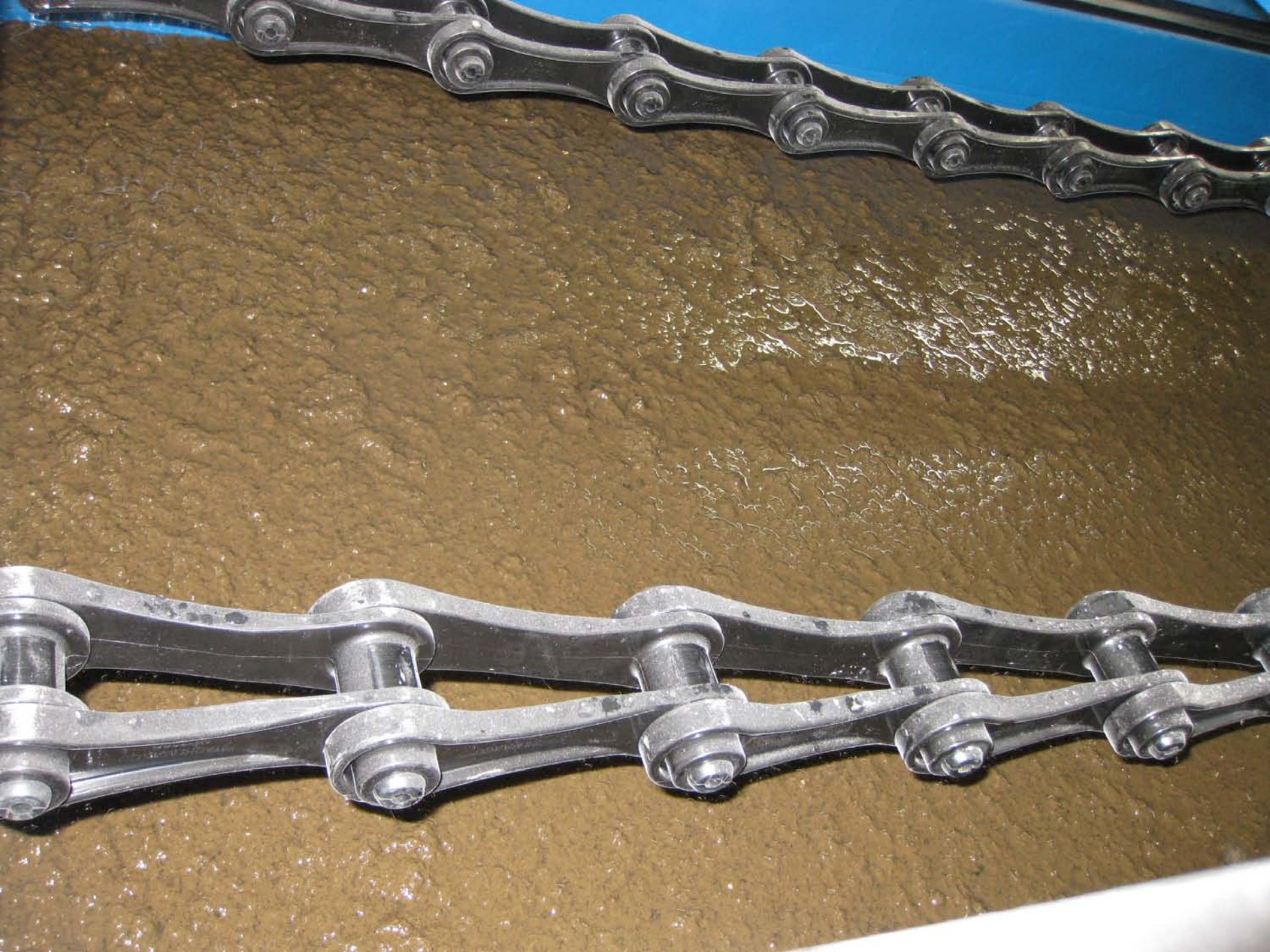

SAUK CENTRE SEWAGE TREATMENT

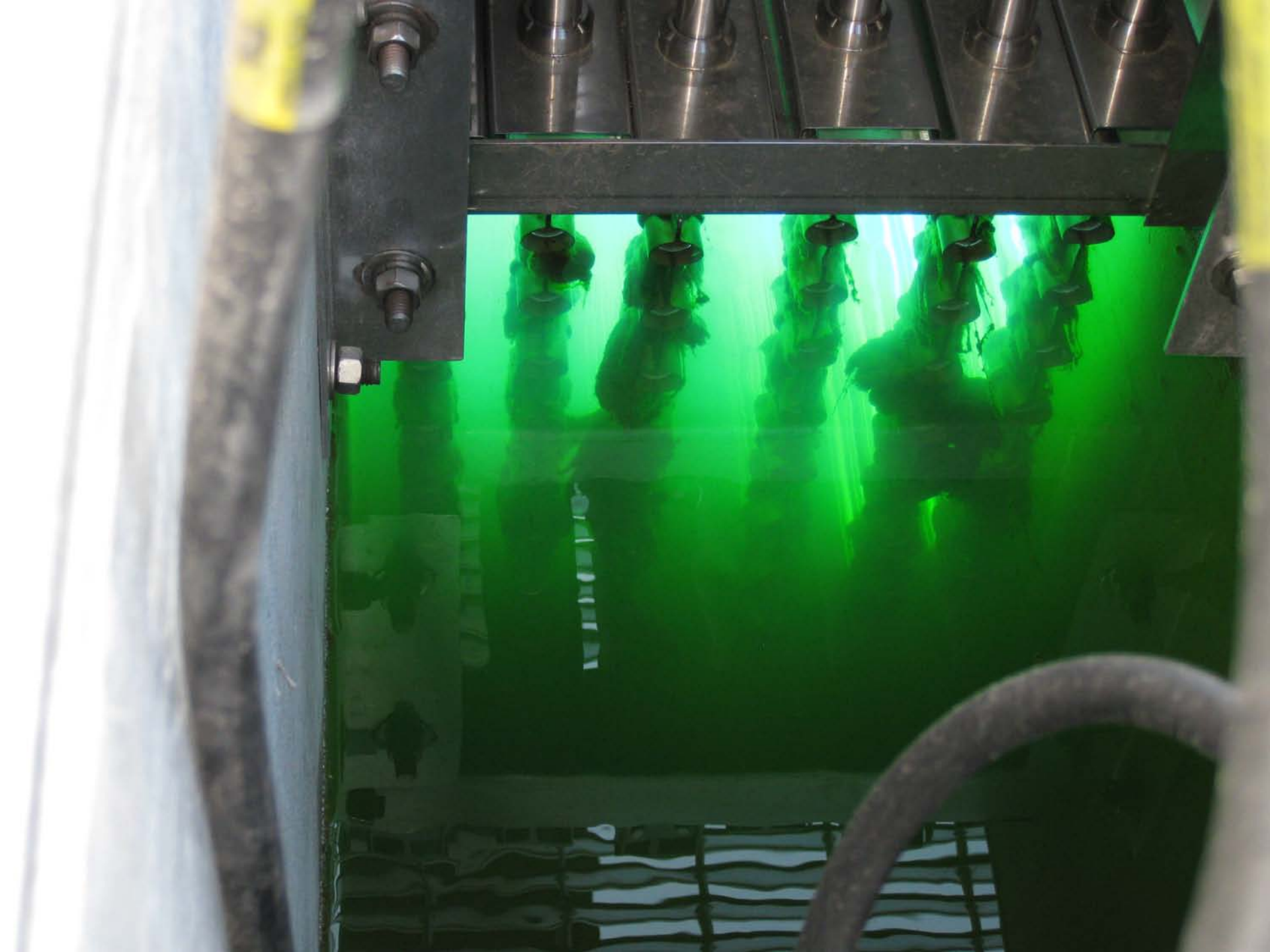

BASF
Headline
BASF
The Chemical Company
Net Contents:
3082
9


1000
900
800
700
600
400
300
200
100


HUBER


staab
GENERAL CONTRACT





Cambridge, MN

- Population 7,734
- Significant industry – processes grain fibers
- Current Average Daily Flow – 0.8 to 1.0 mgd
- Project cost $<1.0
- 50 feet secondary digester cover replaced as the steel cover was badly corroded and could no longer hold methane gas or float
- Upgrade: New Dystor membrane gas methane gas storage of 30,700 cu feet – can hold up to 3 to 6 times more gas than conventional systems


CAUTION


STO

Montevideo, MN

- Population 5,178
- Main Industry - Jennie-O Turkey Store
- Current Average Daily Flow – 0.9 to 1.2 mgd
- Project cost $12.0 million
- Plant upgrade due to phosphorus regulations, aging equipment and structures
- New pretreatment building for screening, pumping, grit removal, alum feed system, new aeration headers, gravity belt thickening, aerobic digesters, sludge storage


HOLM BROS.
DEERE

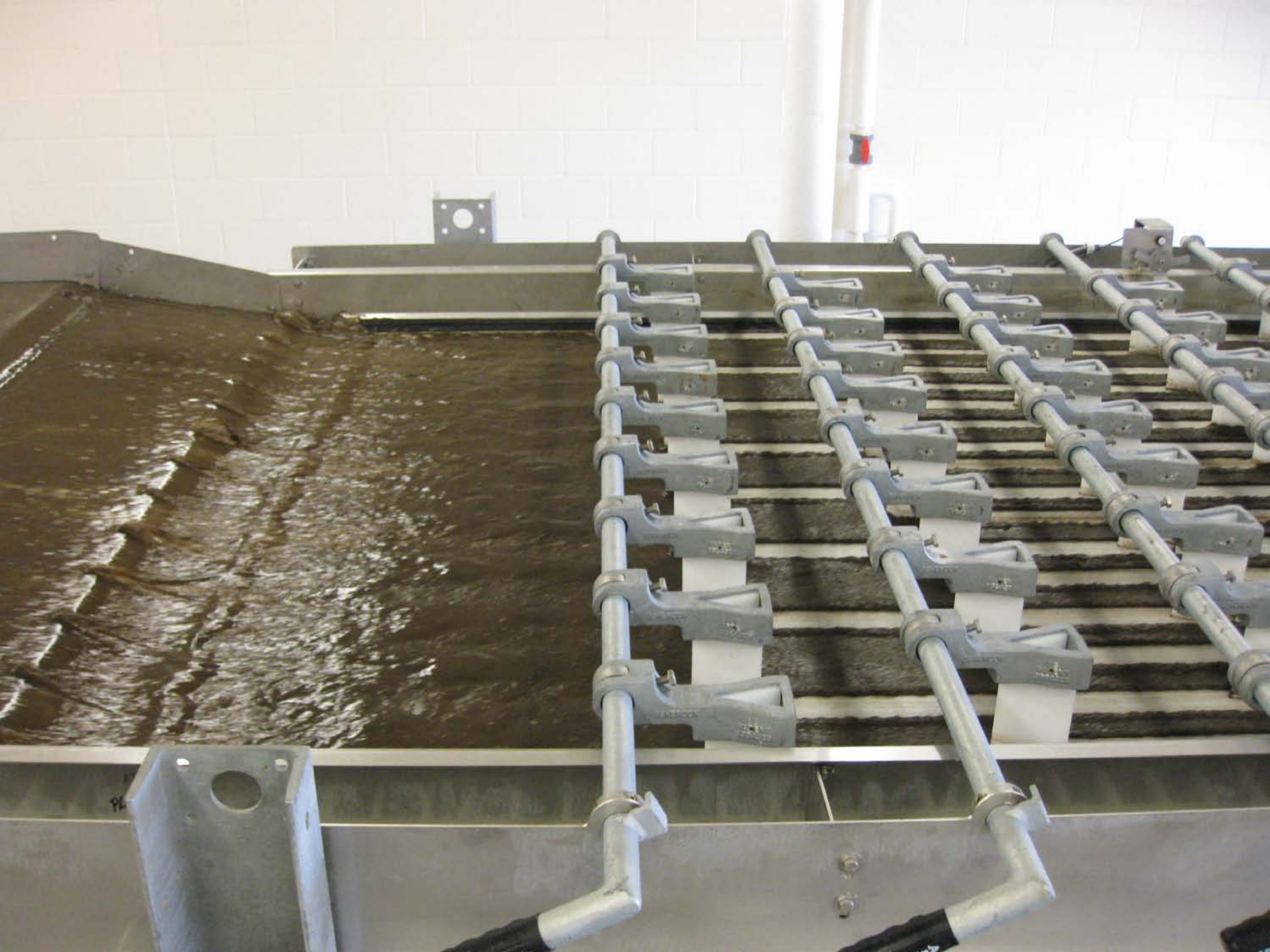

AMERICAN


HUBER
ROTAT
900106


NON-POTABLE WATER
CLASSIFIER DRAIN


ROOTS
EASTON


GBT FEED
WAS
WAS



Bismarck, ND

- Population – 61,272
- Average Daily Flow - 9.5 to 10.0 mgd
- Project cost $<2.0 million
- Upgrade to Primary and Secondary Digesters
  - New steel covers on 2 primary digesters
  - Painted and insulated
  - New draft tube mixers
  - New waste gas burner
  - Other improvements


CAUTION
CLOSE MAIN
VALVE BEFORE
LIGHTING PILOT


FORD


425
SULLAIR

Questions?