Appendix D

SAWS Capacity Assessment and Remediation Program Process and Guidelines

See Page 3

Remedial Measures Alternatives Analysis (CD Subsection V.D)

For each confirmed capacity constraint, perform engineering analysis and collect any necessary additional data to select:

- Make-ready
- Pipe-equal
- Pipe-greater
- CCT
- Other alternative

Use engineering judgment to determine the most likely preferred alternative to remove constraint and achieve compliance. Alternative measures include but not limited to: (1) Reduction or elimination of wet weather flows; (2) Reducing flow entering the WWTP from customers; (3) Reduction of infiltration; (4) Repair or rehabilitation; (5) Increase conveyance capacity of WWTP; (6) Increase flow detention facilities; (7) Enhanced monitoring if appropriate; (8) Other engineering solutions.

Notes:

Note: Perform steps 1 and 2 iteratively with step 3 to determine appropriate measures selected.

Plan and Implement Capacity Remedial Measures (CD Subsection V.D)

- Prioritize remedial measures and periodically evaluate priorities
  - Generally review severity of capacity constraints identified during inspections, frequency and history of capacity related SSOs, age of pipe, age of line material, annual maintenance history, annual tap of Original Construction, wet weather flow growth, collection improvements and connection of new improvements and other grounds deemed relevant to be appropriate by SAWS
- In compliance with conditions, remedial measures are needed
- All pipe sizes
- Design as needed
- Typically, SAWS will consider, first, to serve larger commercially available diameter for upsize projects if warranted under the specific circumstances for a remedial measure
- Implement remedial measures

Capacity Remedial Measures Plan (CD Subsection V.D)

- SAWS Capacity Remedial Measures Plan
- See Page 10 Appendix S

APPENDIX E

APPENDIX E
LIFT STATION REHABILITATION AND ELIMINATION PROGRAM

SAWS has been implementing a phased lift station rehabilitation and elimination program since 2005. Under this program SAWS assesses each lift station in its collection system (totaling approximately 170 lift stations from 2005 through June 2012). Based on each lift station assessment, SAWS makes a determination regarding 1) which lift stations can be eliminated by the diversion of flow to gravity mains and 2) for the remaining lift stations, what if any measures are warranted to upgrade the lift station. While SAWS lift station assessments are conducted on a case-by-case basis, a number of typical evaluation factors are routinely considered. These factors are described below. In addition, decisions to eliminate or upgrade a lift station are made on a case-by-case basis, applying the types of considerations described below.

Generally, the primary consideration in determining whether a lift station will be eliminated is the feasibility and merits of diverting flow to Gravity Sewer Mains. For those lift stations that will not be eliminated, an assessment is conducted to determine what repairs or rehabilitation may be warranted. The assessment process develops information and considers a wide variety of factors to determine the condition, capacity and operating performance of a lift station and identifies potential measures to improve condition, capacity and/or operating performance. Not all considerations are applicable to each lift station, nor does each consideration apply to each lift station in the same way, since each lift station is unique. Thus, the improvements selected for each lift station will vary, although in each case SAWS 1) installs a SCADA system for each lift station that is to be upgraded and 2) compares the lift station attributes to the Texas regulations for the design and construction of new lift stations in 30 Tex.

Admin. Code, Chapter 217. These Texas regulations provide numerous design and construction requirements including, among many others, wet well capacity, pump capacity and velocities, provisions for power quick connect facilities for portable electric generators, pump cycle times and criteria for air release valves and vaults. The purpose of the comparison is to determine for each lift station whether upgrades to conform to these new lift station regulations are appropriate. SAWS is not required by law to retrofit its lift stations to new lift station design or construction standards.

Generally, the assessment process examines the condition, capacity and operating performance of the lift station including the following types of considerations:

1. Drawdown tests are performed to determine pump capacity.
2. The condition of the wet well is inspected for structural defects.
3. The condition of the wet well liner is inspected to determine if lining repair is necessary.
4. The condition of the pumps and motors is determined.
5. Determination of the need for secondary pumps is made.
6. The condition of all inlet piping is examined.
7. Upgrading the power supply to 480 volts is analyzed.
8. The addition of soft start motor starters is considered.
9. The addition of surge arrestors for power surge protection is considered.
10. The condition of pump suction pipes is determined.
11. An analysis of site security features is made.
12. Settings on any floats or switches that operate based on fluid level are inspected.
13. The condition of wet well suction piping is examined.
14. The pump priming system is examined.

Based upon the information developed in the assessment process, SAWS identifies recommendations for each lift station for potential upgrades. Such recommendations are unique to each lift station, based upon the results of the assessment. Improvements that SAWS determines to make are then planned, funded and implemented, typically through contracts subject to the public bidding process that SAWS is required by law to follow.

The current status of the lift station rehabilitation and elimination program is described in the attached table.

SAWS Lift Station Data for CD Appendix

Station ID	Construction or Rehabilitation Date	Construction or Rehab Note	Date of Most Recent SSO	Assessment for I5 Elimination or Rehab	Field Measured Peak Hydraulic Capacity	Model-Predicted Peak Hydraulic Flowrate (MGD)	Availability and Type of Backup Power	Equipped with SCADA	Overall Condition	Risk of Failure	Consequence of Failure	Date of Anticipated Upgrade or Decommission	Date of Upgrade Note	Comments
4	7/1/1956		N/A	3/27/2007	N/M	N/M	QC	No	Adequate	Low	Low	9/30/2014		
11	12/5/1983		6/21/2011	9/16/2004	4.878	3.195	QC	No	Adequate	Low	High	12/31/2016	D	
16	4/30/2012	R	9/24/2003	3/28/2007	1.21	0.878	Generator	Yes	Good	Low	High	Completed		
20	9/22/2009	R	N/A	9/14/2004	N/M	N/M	QC	Yes	Good	Low	Low	Completed		
23	5/8/2012	R	9/7/2010	3/26/2007	N/M	N/M	QC	Yes	Good	Low	Low	Completed		
26	1/1/1961		N/A	3/27/2007	N/M	N/M	QC	No	Adequate	Low	Low	12/31/2018		
35	8/24/1970		N/A	3/28/2007	N/M	N/M	QC	No	Adequate	Low	Low	9/30/2014		
52	11/12/2009	R	N/A	9/14/2004	1.412	N/M	QC	Yes	Good	Low	Low	Completed		
57	5/24/1990		N/A	3/28/2007	N/M	1.237	QC	No	Adequate	Low	High	8/31/2013		
61	5/22/2012	R	N/A	3/26/2007	N/M	N/M	QC	Yes	Good	Low	Low	Completed		
73	4/22/1977		N/A	3/29/2007	N/M	N/M	QC	No	Adequate	Low	Low	12/31/2017	D	
74	4/22/1977		5/14/2011	3/29/2007	N/M	N/M	QC	No	Adequate	Low	Low	9/30/2014		
80	7/29/1976		N/A	9/16/2004	N/M	N/M	QC	No	Good	Low	Low	12/31/2019		Lift station is not in operation
94	11/15/1979		N/A	4/5/2007	N/M	N/M	QC	No	Adequate	Low	Low	12/31/2017	D	
100	10/19/2009	R	6/20/2006	9/1/2004	N/M	N/M	Generator	Yes	Good	Low	High-EARZ	Completed		
102	10/19/2009	R	N/A	9/1/2004	N/M	N/M	Generator	Yes	Good	Low	High-EARZ	Completed		
103	8/29/1980		N/A	4/26/2007	N/M	N/M	QC	No	Adequate	Low	Low	12/31/2017	D	
105	2/23/1981		N/A	9/14/2004	N/M	N/M	QC	No	Adequate	Low	Low	12/31/2018		
111	12/29/1981		7/22/2010	8/26/2007	N/M	N/M	QC	No	Adequate	Low	Low	12/31/2016	D	
121	1/25/2012	R	5/27/2012	9/30/2004	3.386	1.481	Generator	Yes	Good	Low	High-EARZ	Completed		
126	10/22/2010		N/A	8/31/2004	N/M	N/M	Generator	Yes	Good	Low	High-EARZ	Completed		
131	1/1/1985		4/7/2003	9/1/2004	N/M	N/M	QC	No	Adequate	Low	Low	12/31/2015	D	
132	10/19/2009	R	N/A	9/1/2004	N/M	N/M	Generator	Yes	Good	Low	High-EARZ	Completed		
134	1/22/2010	R	N/A	8/31/2004	N/M	N/M	Generator	Yes	Good	Low	High-EARZ	Completed		
135	11/20/1985		N/A	8/21/2004	N/M	N/M	QC	No	Adequate	Low	High-EARZ	12/31/2017	D	
137	11/12/1985		N/A	3/27/2007	N/M	N/M	QC	No	Adequate	Low	Low	12/31/2018		
144	2/1/2012	R	N/A	9/9/2004	N/M	N/M	QC	Yes	Good	Low	Low	Completed		
145	1/31/1975		N/A	4/5/2007	N/M	N/M	QC	No	Adequate	Low	Low	12/31/2017	D	
147	11/29/2011	R	N/A	9/1/2004	N/M	N/M	Generator	Yes	Good	Low	High-EARZ	Completed		
148	11/12/1986		10/10/2009	3/29/2007	N/M	N/M	QC	No	Adequate	Low	Low	9/30/2014		
150	3/14/2012	R	N/A	8/31/2004	0.796	0.294	Generator	Yes	Good	Low	High-EARZ	Completed		
151	10/27/2010	R	3/4/2008	8/31/2004	N/M	N/M	Generator	Yes	Good	Low	High-EARZ	Completed		
156	12/10/2011	R	N/A	3/28/2007	0.956	0.374	QC	Yes	Good	Low	High	Completed		
162	1/13/1988		N/A	3/26/2007	1.789	1.359	QC	No	Adequate	Low	High	9/30/2014		
163	3/10/1988		12/23/2009	9/16/2008	N/M	N/M	QC	No	Adequate	Low	Low	12/31/2014		
164	8/4/1988		N/A	3/26/2012	N/M	N/M	QC	No	Adequate	Low	Low	9/30/2014		
165	10/27/1987		4/19/2012	9/16/2004	1.051	1.051	QC	No	Adequate	Low	High-EARZ	9/30/2014		
166	6/15/1988		N/A	3/28/2007	N/M	N/M	QC	No	Adequate	Low	Low	12/31/2018		
167	6/15/1988		N/A	3/28/2007	N/M	N/M	QC	No	Adequate	Low	Low	12/31/2018		
169	10/27/2010	R	8/14/2010	9/1/2004	N/M	N/M	Generator	Yes	Good	Low	Low	Completed & 12/31/2020	D	
170	6/9/1989		6/6/2011	3/29/2007	N/M	N/M	QC	No	Adequate	Low	Low	8/31/2013		
171	5/2/2012	R	N/A	9/1/2004	N/M	N/M	QC	Yes	Good	Low	High-EARZ	Completed		
172	8/1/1988		10/26/2009	9/14/2004	23.342	10.315	Generator	No	Adequate	Low	High	9/30/2014		
175	10/18/1993		N/A	9/9/2004	N/M	N/M	QC	No	Adequate	Low	Low	9/30/2014		
176	11/13/1990		N/A	9/11/2008	N/M	N/M	QC	No	Adequate	Low	Low	12/31/2014		

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178	10/10/1991		N/A	3/29/2007	N/M	N/M	QC	No	Adequate	Low	Low	9/30/2015		
179	10/10/1991		N/A	3/29/2007	NPD	NPD	QC	No	Adequate	Low	High	12/31/2013		
180	10/10/1991		N/A	3/29/2007	0.936	0.346	QC	No	Adequate	Low	High	8/31/2013		
182	5/8/1981		N/A	9/17/2008	N/M	N/M	QC	No	Adequate	Low	Low	12/31/2018	D	
187	10/6/1986		7/18/2012	Not assessed	NPD	NPD	Generator	No	Adequate	Low	High	12/31/2018		
188	5/17/2001		8/19/2012	9/9/2008	2.463	2.49	QC	No	Adequate	Low	High	12/31/2014		
189	8/23/1968		7/26/2007	9/26/2008	N/M	N/M	QC	No	Adequate	Low	Low	12/31/2014		
190	4/29/1992		N/A	3/27/2007	N/M	N/M	QC	No	Adequate	Low	Low	12/31/2014		
191	3/14/2012	R	12/27/2010	8/31/2004	3.168	9.001	Generator	Yes	Good	Low	High-EARZ	Completed		
192	8/2/2012	R	3/27/2012	3/29/2007	N/M	N/M	QC	Yes	Good	Low	Low	Completed		
193	1/22/1993		N/A	10/1/2008	N/M	N/M	QC	No	Adequate	Low	Low	12/31/2016	D	
194	1/22/2012	R	N/A	9/9/2004	N/M	N/M	QC	Yes	Good	Low	Low	Completed		
197	6/7/1994		N/A	9/15/2008	N/M	N/M	QC	No	Adequate	Low	Low	12/31/2018	D	
198	2/16/2007		9/9/2010	Not assessed-to be eliminated	NPD	NPD	Generator	No	Adequate	Low	High	12/31/2019	D	
199	11/21/1994		9/16/2012	Not assessed-to be eliminated	NPD	NPD	Generator	No	Adequate	Low	High	12/31/2019	D	
200	11/21/1994		8/4/2012	Not assessed-to be eliminated	NPD	NPD	Generator	No	Adequate	Low	High	12/31/2019	D	
201	11/21/1994		9/14/2012	Not assessed	NPD	NPD	Generator	No	Adequate	Low	High	12/31/2018		
202	11/17/2011	R	N/A	9/1/2004	N/M	N/M	QC	Yes	Good	Low	Low	Completed		
203	7/19/2012	R	N/A	3/28/2007	N/M	N/M	QC	Yes	Good	Low	Low	8/31/2014		
205	11/9/1995		6/14/2010	9/16/2008	N/M	N/M	QC	No	Adequate	Low	Low	12/31/2014		
206	3/5/1996		N/A	9/1/2004	N/M	N/M	QC	No	Adequate	Low	Low	9/30/2014		
207	5/6/1996		N/A	9/15/2008	N/M	N/M	QC	No	Adequate	Low	Low	12/31/2014		
208	7/1/1996		N/A	9/1/2004	N/M	N/M	QC	No	Adequate	Low	Low	9/30/2014		
209	4/14/1997		7/27/2010	9/1/2004	N/M	N/M	QC	No	Adequate	Low	High-EARZ	9/30/2014		
210	2/14/1997		N/A	9/18/2008	N/M	N/M	QC	No	Adequate	Low	Low	12/31/2014		
211	6/24/1997		N/A	9/23/2008	N/M	N/M	QC	No	Adequate	Low	Low	12/31/2014		
213	12/1/1984		N/A	9/9/2004	N/M	N/M	QC	No	Adequate	Low	Low	8/31/2013		
215	10/8/2009	R	N/A	8/31/2004	N/M	N/M	Generator	Yes	Good	Low	High-EARZ	Completed		
217	8/19/1998		N/A	3/29/2007	N/M	N/M	QC	No	Adequate	Low	Low	12/31/2017	D	
218	5/2/2000		N/A	9/1/2004	N/M	N/M	QC	No	Adequate	Low	Low	9/30/2014		
219	10/13/1999		8/18/2012	9/22/2008	2.914	0.2665	Generator	No	Adequate	Low	High	12/31/2016	D	
220	6/24/1999		N/A	3/27/2007	N/M	N/M	QC	No	Adequate	Low	Low	9/30/2014		
221	8/25/1999		N/A	3/27/2007	3.199	1.803	Generator	No	Adequate	Low	High	9/30/2013		
222	6/13/2012	R	1/23/2012	3/28/2012	N/M	N/M	QC	Yes	Good	Low	Low	Completed		
223	6/21/2012	R	N/A	3/28/2007	N/M	N/M	QC	Yes	Good	Low	Low	Completed		
224	8/18/2000		N/A	9/22/2008	N/M	N/M	QC	No	Adequate	Low	Low	12/31/2019	D	
225	8/10/2007		8/17/2007	9/14/2004	N/M	N/M	QC	No	Adequate	Low	Low	12/31/2019	D	
226	1/23/2001		N/A	8/31/2004	N/M	N/M	QC	Yes	Adequate	Low	High-EARZ	9/30/2014		
228	9/28/2001		N/A	9/18/2008	N/M	N/M	QC	No	Adequate	Low	Low	12/31/2014		
230	11/3/2000		N/A	9/9/2004	N/M	N/M	QC	No	Adequate	Low	High-EARZ	9/30/2014		
231	2/15/2002		N/A	8/31/2004	N/M	N/M	QC	No	Adequate	Low	High-EARZ	9/30/2014		
232	11/26/2002		10/3/2010	9/1/2004	N/M	N/M	QC	No	Adequate	Low	Low	12/31/2020	D	
233	4/11/2003		5/29/2008	9/9/2004	N/M	N/M	Generator	No	Adequate	Low	Low	9/30/2014		
234	4/23/2003		N/A	3/27/2004	N/M	N/M	QC	No	Adequate	Low	Low	9/30/2013		
235	5/31/2012	R	10/31/2010	9/16/2004	N/M	N/M	Generator	Yes	Good	Low	High-EARZ	Completed		

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236	8/20/2003		N/A	9/16/2004	N/M	N/M	QC	No	Adequate	Low	High-EARZ	9/30/2014		
237	5/26/2003		N/A	9/17/2008	N/M	N/M	QC	No	Adequate	Low	Low	12/31/2014		
238	3/9/2004		2/18/2009	3/27/2007	4,076	2,193	Generator	No	Adequate	Low	High	9/30/2013		
239	8/25/1999		8/31/2007	9/23/2008	N/M	N/M	Generator	No	Adequate	Low	Low	12/31/2014		
240	6/7/2004		7/5/2006	9/1/2004	N/M	N/M	QC	No	Adequate	Low	High-EARZ	9/30/2014		
241	12/30/2010		12/21/2010	NC	N/M	N/M	QC	Yes	Good	Low	Low	Completed		
242	12/30/2010	R	N/A	NC	N/M	N/M	QC	Yes	Good	Low	Low	Completed		
243	12/30/2010	R	N/A	NC	N/M	N/M	Generator	Yes	Good	Low	Low	Completed		
244	12/30/2010	R	N/A	NC	N/M	N/M	QC	Yes	Good	Low	Low	Completed		
245	7/1/2005		N/A	9/23/2008	N/M	N/M	QC	No	Adequate	Low	Low	12/31/2014		
246	10/6/2006		N/A	NC	NPD	NPD	Generator	Yes	Good	Low	High	NR		
247	12/30/2010	R	N/A	NC	N/M	N/M	QC	Yes	Good	Low	High-EARZ	Completed		
248	8/23/2005		N/A	NC	N/M	N/M	Generator	No	Good	Low	Low	9/30/2014		
249	9/8/2005		N/A	NC	NPD	NPD	Generator	No	Good	Low	High-EARZ	9/30/2014		
250	12/30/2010	R	N/A	NC	NPD	NPD	Generator	Yes	Good	Low	High	Completed		
251	12/30/2010	R	N/A	NC	N/M	N/M	Generator	Yes	Good	Low	Low	Completed & 12/31/2019	D	
252	2/3/2006		N/A	NC	N/M	N/M	QC	No	Good	Low	High-EARZ	12/31/2014		
253	2/7/2006		N/A	9/26/2008	N/M	N/M	QC	No	Adequate	Low	Low	12/31/2014		
254	12/30/2010	R	9/11/2007	NC	N/M	N/M	Generator	Yes	Good	Low	Low	Completed & 12/31/2016	D	
255	12/30/2010	R	N/A	NC	N/M	N/M	QC	Yes	Good	Low	Low	Completed		
256	12/30/2010	R	N/A	NC	N/M	N/M	QC	Yes	Good	Low	Low	Completed		
257	7/24/2006		N/A	NC	N/M	N/M	QC	No	Good	Low	Low	12/31/2014		
258	8/14/2006		N/A	NC	NPD	NPD	Generator	No	Good	Low	High	12/31/2014		
259	12/30/2010	R	N/A	NC	N/M	N/M	QC	Yes	Good	Low	Low	Completed		
260	12/30/2010	R	N/A	NC	N/M	N/M	Generator	Yes	Good	Low	High-EARZ	Completed		
261	12/30/2010	R	6/22/2011	NC	N/M	N/M	QC	Yes	Good	Low	Low	Completed		
262	12/30/2010	R	N/A	NC	N/M	N/M	QC	Yes	Good	Low	Low	Completed		
263	4/25/2007		N/A	NC	N/M	N/M	Generator	No	Good	Low	High-EARZ	12/31/2014		
264	10/9/2007		N/A	NC	N/M	N/M	Generator	No	Good	Low	Low	12/31/2014		
265	1/3/2008		N/A	NC	N/M	N/M	Generator	No	Good	Low	High-EARZ	12/31/2014		
266	7/3/2008		N/A	NC	N/M	N/M	QC	Yes	Good	Low	Low	NR		
267	7/9/2008		N/A	NC	N/M	N/M	QC	No	Adequate	Low	Low	12/31/2019	D	
268	9/23/2008		N/A	NC	N/M	N/M	Generator	Yes	Good	Low	High-EARZ	NR		
269	11/3/2008		6/16/2009	NC	NPD	NPD	Generator	Yes	Good	Low	High	NR		
270	10/7/2009		N/A	NC	N/M	N/M	Generator	No	Good	Low	Low	12/31/2014		
271	5/21/2009		N/A	NC	N/M	N/M	QC	Yes	Good	Low	Low	NR		
272	12/22/2009		N/A	NC	N/M	N/M	QC	Yes	Good	Low	Low	NR		
273	2/3/2009		N/A	NC	N/M	N/M	Generator	Yes	Good	Low	Low	NR		
274	8/22/2010		N/A	NC	N/M	N/M	QC	Yes	Good	Low	Low	NR		
276	12/13/2010		N/A	NC	N/M	N/M	Generator	Yes	Good	Low	Low	NR		
277	5/24/2011		N/A	NC	N/M	N/M	Generator	Yes	Good	Low	Low	NR		
278	9/15/2011		N/A	NC	N/M	N/M	QC	Yes	Good	Low	Low	NR		
300	6/1/1965		N/A	9/5/2008	N/M	N/M	Generator	No	Adequate	Low	Low	10 years after Date of Lodging		
303	8/9/1996		N/A	9/11/2008	N/M	N/M	Generator	No	Adequate	Low	Low	10 years after Date of Lodging		
304	6/1/1965		N/A	9/4/2008	N/M	N/M	Generator	No	Adequate	Low	Low	10 years after Date of Lodging		

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305	6/1/1965		N/A	Not assessed	N/M	N/M	QC	No	Adequate	Low	Low	10 years after Date of Lodging		
307	6/1/1965		N/A	9/4/2008	N/M	N/M	QC	No	Adequate	Low	Low	10 years after Date of Lodging		
308	6/1/1965		N/A	9/4/2008	N/M	N/M	QC	No	Adequate	Low	Low	10 years after Date of Lodging		
309	6/1/1965		N/A	9/4/2008	N/M	N/M	QC	No	Adequate	Low	Low	10 years after Date of Lodging		
310	6/1/1965		N/A	9/10/2008	N/M	N/M	QC	No	Adequate	Low	Low	10 years after Date of Lodging		
311	8/9/1996		N/A	9/23/2008	N/M	N/M	QC	No	Adequate	Low	Low	10 years after Date of Lodging		
312	8/9/1996		N/A	9/23/2008	N/M	N/M	QC	No	Adequate	Low	Low	10 years after Date of Lodging		
313	6/1/1965		N/A	9/5/2008	N/M	N/M	QC	No	Adequate	Low	Low	10 years after Date of Lodging		
315	6/1/1965		N/A	9/5/2008	N/M	N/M	QC	No	Adequate	low	Low	10 years after Date of Lodging		
316	6/1/1965		N/A	9/5/2008	N/M	N/M	QC	No	Adequate	Low	Low	10 years after Date of Lodging		
317	8/9/1996		N/A	9/23/2008	N/M	N/M	QC	No	Adequate	Low	Low	10 years after Date of Lodging		
318	8/9/1996		N/A	9/23/2008	N/M	N/M	QC	No	Adequate	Low	Low	10 years after Date of Lodging		
319	8/9/1996		N/A	9/23/2008	N/M	N/M	QC	No	Adequate	Low	Low	10 years after Date of Lodging		
320	6/1/1965		N/A	9/10/2008	N/M	N/M	QC	No	Adequate	Low	Low	10 years after Date of Lodging		
321	6/1/1965		N/A	9/24/2008	N/M	N/M	Generator	No	Adequate	Low	Low	10 years after Date of Lodging		
322	6/1/1965		N/A	9/10/2008	N/M	N/M	Generator	No	Adequate	Low	Low	10 years after Date of Lodging		
323	6/1/1965		1/23/2012	9/9/2008	N/M	N/M	Generator	No	Adequate	Low	Low	10 years after Date of Lodging		
324	6/1/1965		N/A	9/9/2008	N/M	N/M	QC	No	Adequate	Low	Low	10 years after Date of Lodging		
325	6/1/1965		N/A	9/9/2008	N/M	N/M	QC	No	Adequate	Low	Low	10 years after Date of Lodging		
326	6/1/1965		N/A	9/9/2008	N/M	N/M	QC	No	Adequate	Low	Low	10 years after Date of Lodging		
328	6/1/1965		N/A	9/9/2008	N/M	N/M	QC	No	Adequate	Low	Low	10 years after Date of Lodging		
329	6/1/1965		N/A	9/10/2008	N/M	N/M	QC	No	Adequate	Low	Low	10 years after Date of Lodging		
330	6/1/1965		N/A	9/24/2008	N/M	N/M	QC	No	Adequate	Low	Low	10 years after Date of Lodging		
331	10/26/2004		N/A	9/18/2008	N/M	N/M	QC	No	Adequate	Low	Low	10 years after Date of Lodging		

1 "N/A" indicates that a lift station has not had an SSO.
2 "N/M" indicates that a lift station is not individually modeled in the hydraulic model and therefore no comparison of field measured and model predicted flow is available.
3 Flow from field measured pump drawdown tests was aggregated and converted from GPM to MGD.
4 "R" refers to the date that rehabilitation was completed
5 "Adequate" indicates that a lift station is fully performing, but that it will be rehabilitated/upgraded as described in this Appendix.
6 All lift stations have a low risk of failure. Any risks identified by SAWS lift station maintenance department are corrected.
7 Lift stations that do not have a generator either have, or will have on completion of rehabilitation, quick- connect facilities for portable power generation.
8 All lift stations will have SCADA on completion of rehabilitation. A Verbatim alert system is in operation pending SCADA installation.
9 A "High" consequence indicates a lift station that is located over the Edwards Aquifer Recharge Zone (EARZ) or that is a large volume flow (2MGD and greater) lift station.
10 "D" indicates the date of anticipated decommissioning.
11 "Completed" indicates that rehabilitation of a lift station has been completed.
12 "NPD" indicates that a field pump drawdown test for all pumps in a lift station is not available. A comparison with model predicted flow is, therefore, not possible.
13 Rehabilitation/upgrade has been completed, but the lift station will also be decommissioned.
14 "NC" indicates that a lift station was recently constructed and met TCEQ and SAWS guidelines at the time of SAWS acceptance; or required only SCADA installation that has now been completed. No further assessment was necessary.
15 "NR" indicates lift stations that have been recently constructed and that meet TCEQ and SAWS guidelines. No rehabilitation, upgrade, or assessment is necessary.
16 300 series lift stations were inherited from the U.S Air Force and are located on Lackland A.F.B. and the former Kelly A.F.B.
17 Determined to be a holding tank for aircraft waste.
18 SAWS intends to eliminate or rehabilitate the 300 series lift stations. A final determination on the appropriate action has not yet been made.
19 "QC" indicates a quick connect facility is installed for portable generation.

APPENDIX F

Appendix F
Phase I Early Action Program

I. Overall Description of Remedial Measures

SAWS Early Action Program (EAP) Phase I consists of the following types of Remedial Measures:

- Large Diameter Condition Remedial Measures
- Large Diameter Capacity Remedial Measures
- Small Diameter Condition Remedial Measures
- Manhole Condition Remedial Measures

The projects associated with these Remedial Measures are summarized in the Table in Part II of this Appendix F. Following is a general description of the EAP Phase I Remedial Measures.

Large Diameter Condition Remedial Measures

Through SAWS CCTV program, SAWS has identified approximately 13.3 miles of large diameter mains for alternatives analysis. The 13.3 miles were identified due to structural defects that have caused, or may cause, structural SSOs in the future.

Prior to the establishment of Appendix C, this process was called issuing a "Design Request." After the establishment of Appendix C, this step is called a request to conduct "remedial measures alternatives analysis," which could either result in a remedial measure, monitoring, or maintenance.

Of the 13.3 miles, approximately 6.3 miles has been assessed and designed as of March 31, 2013, and approximately 7 miles awaits alternatives analysis. Of the 6.3 miles which has been designed, 4.4 miles is the San Antonio River Outfall Project Phase 1 and 2. For the remaining 1.9 miles SAWS is in the process of packaging the pipes into bid packages, or "projects," as well as prioritizing the projects over the five years of the EAP Phase I. SAWS has identified two projects for the 1.9 miles of the pipe that have been assessed and designed. For the 7 miles awaiting alternatives analysis, those pipes which result in a remedial measure will be added to these two projects (which is why the total project mileage adds up to 13.3 miles of pipe for EAP Phase I). If certain pipes from the 7 miles do not result in remedial measures, a similar mileage of higher risk pipe that has yet to be identified will be added to the EAP Phase I mileage to make up the difference. Projects may be divided into smaller projects to further prioritize projects related to SSOs, address contractor bidding constraints, or to reduce construction inspector drive-time per project, but the cumulative mileage of the projects will not be reduced. If the projects are divided into smaller projects, this will be reported in the Annual Report.

The Summary of Remedial Measures for EAP Phase I Table in Part II of this Appendix F shows the status of SAWS alternatives analysis and design process. The Remediation Project List for EAP Phase I table in Appendix F shows the status of Large Diameter Condition Remedial Measures projects for the EAP Phase I.

Appendix F
Phase I Early Action Program

Large Diameter Capacity Remedial Measures

Through SAWS capacity assessment activities, SAWS has identified approximately 25 miles of large diameter mains to be constructed as Capacity Remedial Measures as part of EAP Phase I.

All 25 miles have been grouped into 4 projects outlined in the table in Part II of this Appendix F to be completed under the large diameter capacity EAP Phase I schedule as set forth in the Consent Decree.

The Summary of Remedial Measures for EAP Phase I Table in Part II of this Appendix F shows the status of SAWS alternatives analysis and design process. The Remediation Project List for EAP Phase I Table in Part II of this Appendix F shows the status of Large Diameter Capacity Remedial Measures projects for the EAP Phase I.

Small Diameter Condition Remedial Measures

Through SAWS CCTV program, SAWS has identified approximately 62.5 miles of small diameter mains for alternatives analysis. The 62.5 miles were identified due to structural defects that have caused, or may cause, structural SSOs in the future, as well as less significant defects on pipes that were in close proximity to the structural defect SSO pipes. While these less significant defect pipes are not required to be remediated per Appendix C, SAWS is bundling these pipes with less significant defects with higher priority pipes in order to potentially reduce unit bid costs, and diminish future disruption to its customers.

Prior to the establishment of Appendix C, this process was called issuing a "Design Request." After the establishment of Appendix C, this step is called a request to conduct "remedial measures alternatives analysis," which could either result in a remedial measure, monitoring, or maintenance.

Of the 62.5 miles, approximately 39 miles has been assessed and designed as of March 31, 2013, and approximately 23.5 miles awaits alternatives analysis. Of the 39 miles which has been designed, SAWS is in the process of packaging the pipes into bid packages, or "projects," as well as prioritizing those projects over the three year schedule for small diameter condition projects under EAP Phase I. SAWS has identified two small diameter projects (each involving several miles of pipe) per year for completion as part of Phase I. These 6 projects include the 39 miles of pipes that have been designed. For the 23.5 miles of pipe that is awaiting alternatives analysis, those pipes which result in a remedial measure will be added to these six projects (which is why the total project mileage adds up to 62.5 miles of pipe for EAP Phase I). If certain pipes from the 23.5 miles do not result in remedial measures, a similar mileage of higher risk pipe that has yet to be identified will be added to the EAP Phase I mileage to make up the difference. Projects may be divided into smaller projects to further prioritize projects related to SSOs, address contractor bidding constraints, or to reduce construction inspector drive-time per project, but the cumulative mileage of the projects will not be reduced. If the projects are divided into smaller projects, this will be reported in the Annual Report.

Appendix F
Phase I Early Action Program

The Summary of Remedial Measures for EAP Phase I Table in Part II of this Appendix F shows the status of SAWS alternatives analysis and design process. The Remediation Project List for EAP Phase I Table in Part II of this Appendix F shows the status of Small Diameter Condition Remedial Measures projects for the EAP Phase I.

Manhole Remedial Measures

The manhole project shown in the Table in Part II of this Appendix F consists of high priority manholes which have been identified through SAWS manhole condition assessment activities completed as of January 2, 2013. These are shown in the Remediation Project List for EAP Phase I Table in Part II of this Appendix F.

II. Tables Summarizing EAP Phase I Work

Summary of Remedial Measures for EAP Phase I

Remediation Type	Miles	Summary of Remedial Measures
1. Small Diameter (SD) Condition Remediation		
SD Remediation – Design Completed	39	Identified through SAWS CCTV program that have been assessed and designed. See Project List Below.
SD – Awaiting Remedial Measures Alternatives Analysis	*23.5*	Mileage that has been identified through SAWS CCTV program, but has not gone through the alternatives analysis process. This mileage will continue through alternatives analysis and has been incorporated into the EAP Phase I Project List below.
Total	*62.5*	
2. Large Diameter (LD) Condition Remediation		
LD Remediation – Design Completed	6.3	Identified through SAWS CCTV program that have been assessed and designed. See Project List Below.
LD – Awaiting Remedial Measures Alternatives Analysis	7	Mileage that has been identified through SAWS CCTV program, but has not gone through the alternatives analysis process. This mileage will continue through alternatives analysis and has been incorporated into the EAP Phase I Project List below.
Total	*13.3*	
3. LD Capacity Remediation		
LD Projects	25	See Project List Below.
4. MH Remediation	**Manholes (Number)**	
Manholes	25	Manholes identified through SAWS condition assessment activities that have been assessed and designed.

Appendix F
Phase I Early Action Program

Remediation Project List for EAP Phase I

Project Name	Miles	Target Project Completion Schedule
1. Small Diameter (SD) Condition Remediation		
EAP Phase I – Project 1 – 2013 SD Re-hab Program	12	1 Year from Date of Lodging
EAP Phase I – Project 2 – 2013 SD Re-hab Program	11	1 Year from Date of Lodging
EAP Phase I – Project 3 – 2014 SD Re-hab Program	12	2 Years from Date of Lodging
EAP Phase I – Project 4 – 2014 SD Re-hab Program	11	2 Years from Date of Lodging
EAP Phase I – Project 5 – 2015 SD Re-hab Program	8.5	3 Years from Date of Lodging
EAP Phase I – Project 6 – 2015 SD Re-hab Program	8	3 Years from Date of Lodging
Total	*62.5*	
2. Large Diameter (LD) Condition Remediation		
EAP Phase I – Project 7 – LD Re-hab Program	4.4	5 Years from Date of Lodging
EAP Phase I – Project 8 – LD Re-hab Program	4.5	5 Years from Date of Lodging
San Antonio River Outfall Project Phase 1 and 2	4.4	5 Years from Date of Lodging
Total	*13.3*	
3. LD Capacity Remediation		
Donaldson Terrace	4.6	6 years from Date of Lodging
Broadway Corridor – Josephine to South Alamo Street	4	6 years from Date of Lodging
Broadway Corridor – Carnahan to Mulberry Streets	10	6 years from Date of Lodging
Leon Creek – Highway 90 to New Laredo Highway	6.4	6 years from Date of Lodging
Total	*25*	
4. MH Remediation	**Manholes (Number)**	**Manholes (Number)**
Manhole Project 1	*25*	3 years from Date of Lodging

APPENDIX G

Appendix G
Condition Assessment Report Template

I. Cover

II. Certification Declaration

[Required certification, with language specified by the Consent Decree, signed by a responsible official of SAWS]

III. Table of Contents

[List of sections, tables, figures and appendices included in this report]

IV. Acronyms and Abbreviations

[Definitions of abbreviations and acronyms included in this report]

V. Introduction

A. Purpose

This Report was prepared and submitted pursuant to Paragraph 28 of the Consent Decree.

B. Regulatory Requirements

This Report summarizes Condition Assessment inspections completed by SAWS as of four years after the Date of Lodging pursuant to Paragraphs 23 through 28 of the Consent Decree. These Condition Assessment requirements include Large Diameter Gravity Main Sewer Inspections, Small Diameter Gravity Sewer Main Inspections and Manhole Inspections.

VI. System-Wide Inspection Activities

A. Inspection Method Overview

[Provide a brief description of each inspection method utilized by SAWS; with a reference to the Condition Assessment and Remediation Process and

Guidelines Appendix. Add a discussion of any new inspection technologies utilized, if applicable]

B. Gravity Sewer Main Inspection Map

[Include a map showing the location of the inspections, small diameter and large diameter pipe, inspection method (CCTV, Pole Camera, Visual Inspection), and type of visual inspection (Smoke testing, mechanical proofing, cleaning, dye testing).]

Appendix G
Condition Assessment Report Template

C. Gravity Sewer Main Inspection Status

Gravity Sewer Main Inspection Progress Summary

Asset Description	Inspection Method	Miles of Inspections Required Under Consent Decree[1,3]	Miles Completed Prior to Date of Lodging[2,3]	Miles Completed since Date of Lodging[3]	Miles of Inspections Completed[3]	% Complete[1]
Small Diameter Gravity Sewer - Concrete Pipe and Clay Pipe Installed Prior to 1973	CCTV or other approved techniques	XX				
Small Diameter Gravity Sewer - Clay Pipe Installed from 1973 through 1982	Pole Camera, CCTV, or other approved techniques	XX				
Small Diameter Gravity Sewer - Other Pipe	Pole Camera, CCTV or other approved techniques	N/A				
	Visual Inspection – Smoke Testing	N/A				
	Visual Inspection – Mech. Proofing	N/A				
	Visual Inspection – Sewer Cleaning Findings	N/A				
	Visual Inspection – Dye Testing	N/A				
	Subtotal	N/A				
	Unique Subtotal[4]	XX				
Large Diameter Gravity Sewer	CCTV/other approved method	XX				

Note 1: Visual Inspection, and Large Diameter CCTV Inspection are not required under the Consent Decree to be completed prior to submittal of this report. These inspection types will be completed as part of CMOM after submittal of this report per CD Requirements.

Note 2: Includes small diameter gravity sewer inspections since January 1, 2009 and large diameter gravity sewer inspections since inception of the large diameter program in 2005.

Note 3: Full pipe length is included in mileages.

Note 4: Since some gravity sewer mains may be inspected with multiple visual inspection techniques, this subtotal includes unique miles of small diameter gravity sewer main inspections in order demonstrate compliance for visual inspection.

D. Manhole Inspection Map

[Include a map showing the location of the inspections.]

E. Manhole Inspection Status

Manhole Inspection Summary

Asset Description	Inspection Method	Number of Manhole in System [1]	Manholes Inspected Prior to Date of Lodging[2]	Manholes Inspected Since Date of Lodging	Inspections Completed	% Complete[1]
Manholes	Visual Inspection	XX				
Note 1: Manhole Inspection is not required under the Consent Decree to be completed prior to submittal of this report. Manhole inspections will be completed as part of CMOM after submittal of this report per CD Requirements.						
Note 2: Includes manhole inspections since January 1, 2009.						

VII. Categorization of Sewer Main and Manhole Condition

A. Guidelines

[Provide a brief description of the guidelines used for categorizing condition; consistent with the Condition Assessment and Remediation Process and Guidelines Appendix]

B. Condition Categorization Summary

Condition Categorization Summary

Condition Category	Miles of Small Diameter Sewer Mains [1]	Miles of Large Diameter Sewer Mains [1]	Number of Manholes
Category A – Very Good	XX	XX	XX
Category B – Good	XX	XX	XX
Category C – Fair Condition	XX	XX	XX
Category D – Poor	XX	XX	XX
Category E – Very Poor	XX	XX	XX
Note 1: Full pipe length is included in mileages.			

C. Maps of Condition Categories

[Include one map for small diameter pipe, one map for large diameter pipe, and one map for manholes showing the location of the assets and the Condition Category.]

VIII. Condition Assessment Results

A. Condition Assessment Guidelines

[Provide a brief description of the guidelines used for condition assessment activities; consistent with the Condition Assessment and Remediation Process and Guidelines Appendix. Provide a brief description of how SAWS applied the guidelines to develop the quantities of structural defects selected for Remedial Measures Alternative Analysis, Monitoring (CMOM) and Maintenance Analysis (CMOM).]

B. Condition Assessment Results

Condition Assessment Result	Miles of Small Diameter Sewer Mains [1]	Miles of Large Diameter Sewer Mains [1]	Number of Manholes
Remedial Measures Alternatives Analysis	XX	XX	XX
Monitoring (CMOM)	XX	XX	XX
Maintenance Analysis (CMOM)	XX	XX	XX
Note 1: Full pipe length is included in mileages.			

C. Maps of Condition Assessment Results

[Include one map for small diameter pipe, one map for large diameter pipe, and one map for manholes showing the location of the assets and the Condition Assessment Result.]

Appendix G
Condition Remedial Measures Plan Template

I. Cover

II. Certification Declaration

[Required certification, with language specified by the Consent Decree, signed by a responsible official of SAWS]

III. Table of Contents

[List of sections, tables, figures and appendices included in this report]

IV. Acronyms and Abbreviations

[Definitions of abbreviations and acronyms included in this report]

V. Introduction

A. Purpose

This Plan was prepared and submitted pursuant to Paragraph 30 of the Consent Decree.

B. Regulatory Requirements

This Plan summarizes SAWS recommended Condition Remedial Measures that have been prioritized and selected in accordance with Appendix C to address verified structural defects in the SAWS WCTS that cause or significantly contribute to Condition-related SSOs. This Plan describes SAWS plans to implement the selected Condition Remedial Measures on a balanced annual basis during the remaining term of this Decree. SAWS has prioritized and selected these Condition Remedial Measures based on appropriate factors reflected in Paragraph 30 and in Appendix C of the Consent Decree and in accordance with the requirements of Paragraph 8 of the Decree. The implementation time-frames in this Plan reflect practical planning requirements such as those stated in Paragraph 30 of the Consent Decree.

Appendix G
Condition Remedial Measures Plan Template

VI. Summary of Condition Assessment Summary Report

[Brief summary of the Condition Assessment Summary Report and how it relates to this Plan.

VII. Remedial Measures Alternatives Analysis

A. Guidelines for Alternatives Analysis

The Plan for Condition Remedial Measures follows SAWS completion of the Condition Remedial Measures Alternatives Analysis as described in Paragraph 29 and in Appendix C of the Consent Decree.

B. Remedial Measures Alternatives Analyses Results

[Provide a brief description of the guidelines used for performing alternatives analysis; consistent with Condition Assessment and Remediation Process and Guidelines Appendix. Include a description of guidelines used to select monitoring or maintenance results.]

Results of Completed Remedial Measures Alternatives Analyses

Result	Miles of Gravity Main Sewer[1]	Number of Gravity Sewer Main Pipe Segments	Number of Manholes
Replace[2]	X	X	X
Rehabilitate[2,3]	X	X	X
Repair[2,3]	X	X	X
Monitoring	X	X	X
Maintenance Analysis	X	X	X
Other (Specify)	X	X	X
Totals:	**X**	**X**	**X**

Note 1: Full pipe length is included in mileage

Note 2: Approach for actual implementation may be different than alternatives analysis result per Paragraph 31 of the Consent Decree and Appendix C (Condition Assessment and Remediation Process and Guidelines Appendix)

Note 3: Repairs include spot repairs or remediation of a short section of the pipe segment using trenchless or open-trench remediation. Rehabilitation includes trenchless sewer remediation from manhole to manhole such as CIPP lining or slip-lining.

C. Maps of Alternatives Analyses Results

[Include one map for small diameter pipe and large diameter pipe and one map for manholes showing the location of the assets and the Remedial Measures Alternatives Analysis Results.]

VIII. Remediation Completed

A. Remedial Measures Progress

[Summarize the mileage and number of manholes for which Condition Remedial Measures have been completed prior to submittal of this report.]

	Remedial Measure Technique	Early Action Program - Phase I	Early Action Program - Phase II	Other	Total
Large Diameter Sewer Mains (miles)[1,2]	Replace				
	Rehabilitate				
	Repair				
Small Diameter Sewer Mains (miles)[1,2]	Replace				
	Rehabilitate				
	Repair				
Manholes (number)	Replace				
	Rehabilitate				
	Repair				
Note 1: Full pipe length is included in mileage					
Note 2: Repairs include spot repairs or remediation of a short section of the pipe segment using trenchless or open-trench remediation. Rehabilitation includes trenchless sewer remediation from manhole to manhole such as CIPP lining or slip-lining.					

B. Maps of Remedial Measures Completed

[Include a color coded map for Phase I, a map for Phase II, and another map for Other completed remediation by remediation method and asset type (small

diameter pipe, large diameter pipe, and manholes that identifies and distinguishes between replaced and repaired manholes in Phase I and Phase II of the Early Action Program.]

IX. Remedial Measures Plan

A. Anticipated Remediation Timeframes

[Summarize target remediation quantities for completion each year.]

	Remedial Measure Technique	Calendar Year X	Calendar Year X	Calendar Year X	Calendar Year X	Calendar Year X	Total
Large Diameter Sewer Mains (miles)[1]	Replace						
	Rehabilitate						
	Repair						
Small Diameter Sewer Mains (miles)[1]	Replace						
	Rehabilitate						
	Repair						
Manholes (number)	Replace						
	Rehabilitate						
	Repair						
Note 1: Full pipe length is included in mileage							
Note 2: SAWS may make day-to-day operational changes to Remedial Measures consistent with the Consent Decree, including Appendices C and D of the Consent Decree.							

B. Maps of Anticipated Remediation Timeframe

[Include a color coded map for each year identifying the small diameter pipes, large diameter pipes, and manholes that will be Replaced, Rehabilitated, or Repaired.]

C. Remediation Project List

Remediation Project List

Project Name	Project Miles	Completion Date	For large diameter pipes, schedule Justification for Completion Date After 4.5 years from EPA Approval of Remedial Measures Plan (Pursuant to Paragraph 31 of the Consent Decree)

Appendix G
Capacity Assessment Report Template

I. Cover

II. Certification Declaration

[Required certification, with language specified by the Consent Decree, signed by a responsible official of SAWS]

III. Table of Contents

[List of sections, tables, figures and appendices included in this report]

IV. Acronyms and Abbreviations

[Definitions of abbreviations and acronyms included in this report]

V. Introduction

A. Purpose

This Report was prepared and submitted pursuant to Paragraph 39 of the Consent Decree.

B. Regulatory Requirements

This Report summarizes Capacity Assessment activities pursuant to Paragraph 33 through 38 of the Consent Decree. These Capacity Assessment requirements include Wet Weather SSO Verification, Hydraulic Modeling Evaluation and Field Investigation activities.

VI. Wet-Weather Related SSO Categorization

A. Guidelines

[Provide a brief description of the guidelines used; with a reference to the Capacity Assessment and Remediation Process and Guidelines Appendix. Include the range of dates for historical SSOs that this section covers. Include a summary of the activities performed to address Category C SSOs.]

B. Wet-Weather SSO Categorization Summary

Wet Weather SSO Categorization

Category	Number of SSOs
Category A – Most likely a capacity-related SSO	X
Category B – Most likely maintenance-related	X
Category C – Clearly not a capacity related SSO	X
Total	**X**

C. Map of Wet-Weather SSOs

[Include a map showing the location of Category A, B, and C Wet-Weather SSOs, a map showing the location of Category A Wet-Weather SSOs, a map showing the location of Category B Wet-Weather SSOs, and a map showing the location of Category C Wet-Weather SSOs.]

VII. System-wide Hydraulic Modeling Evaluation

A. Model Overview

[Provide a brief description of the model including software and existing population scenario, consistent with the Capacity Assessment and Remediation Process and Guidelines Appendix.]

B. Model Maps

[Include a map showing the location of pipes in the model.]

C. Model Calibration and Updates

[Provide a summary of any model updates and calibration performed after Date of Lodging of the Consent Decree (e.g. weather permitting) and prior to submittal of the Capacity Assessment Report consistent with the Capacity Assessment and Remediation Process and Guidelines Appendix.

D. Prioritization of Potential Capacity Constraints

[Provide a brief description of the guidelines used to prioritize potential capacity constraints; consistent with the Capacity Assessment and Remediation Process and Guidelines Appendix].

Potential Capacity Constraints Summary

Category	Number of Potential Capacity Constraints
Priority 1 – Category A SSO per Wet-Weather SSO Categorization and where model also predicts a SSO	X
Priority 2 – Where model predicts SSO, but with no observed SSO. Or a Category A SSO per Wet-Weather SSO Categorization, but model does not predict a SSO.	X
Priority 3 – Where model predicts Hydraulic Grade Line (HGL) near ground elevation	X
Priority 4 – Category B SSO per Wet-Weather SSO Categorization	X
Priority 5 – Where pipe design capacity is exceeded for sustained 60 minutes or more but the HGL is not near the ground elevation	X
Total	**X**

E. Map of Potential Capacity Constraints

[Include a map showing potential Capacity Constraints for all Priority Categories. Include separate maps for each Priority Category showing the location of Potential Capacity Constraints.]

VIII. Field Investigations of Potential Capacity Constraints

A. Guidelines

[Provide a brief description of the guidelines used for selecting the type of field investigation technique for each potential capacity constraint; consistent with Capacity Assessment and Remediation Process and Guidelines Appendix.]

B. Field Investigation Status

Completed Field Investigations

Technique	Number of Potential Capacity Constraints				
	Priority 1	Priority 2	Priority 3	Priority 4	Priority 5
Flow Metering	X	X	X	X	X
Smart Covers	X	X	X	X	X
Chalking	X	X	X	X	X
Visual Inspection – Smoke Testing	X	X	X	X	X
Visual Inspection – Mechanical Proofing	X	X	X	X	X
Visual Inspection – Sewer Cleaning Findings	X	X	X	X	X
Visual Inspection – Dye Testing	X	X	X	X	X
Other *(if applicable)*	X	X	X	X	X
Monitor in Future per Capacity Assessment and Remediation Process and Guidelines Appendix (CMOM)	X	X	X	X	X
Total	**X**	**X**	**X**	**X**	**X**

Appendix G
Capacity Assessment Report Template

In-Progress Field Investigations

Technique	Number of Potential Capacity Constraints				
	Priority 1	**Priority 2**	**Priority 3**	**Priority 4**	**Priority 5**
Flow Metering	X	X	X	X	X
Smart Covers	X	X	X	X	X
Chalking	X	X	X	X	X
Visual Inspection – Smoke Testing	X	X	X	X	X
Visual Inspection – Mechanical Proofing	X	X	X	X	X
Visual Inspection – Sewer Cleaning Findings	X	X	X	X	X
Visual Inspection – Dye Testing	X	X	X	X	X
Other *(if applicable)*	X	X	X	X	X
Total	**X**	**X**	**X**	**X**	**X**

C. Map of Completed Field Investigations

[Include a map for each Priority Category showing the location of each field investigation by technique.]

D. Map of In-Progress Field Investigations

[Include a map for each Priority Category showing the location of each field investigation by technique.]

IX. Capacity Assessment Results

A. Capacity Assessment Guidelines

[Provide a brief description of the guidelines used for assessing field investigation results; consistent with Capacity Assessment and Remediation Process and Guidelines Appendix.

B. Capacity Assessment Results

Capacity Assessment Result	Number of Potential Capacity Constraints
Remedial Measures Alternatives Analysis	X
Monitor in the Future per Capacity Assessment and Remediation Process and Guidelines Appendix (CMOM)	X
Not a Capacity Constraint	X
Total	**X**

C. Map of Capacity Assessment Results

[Include a color coded map showing the location of the Capacity Assessment Results.]

Appendix G
Capacity Remedial Measures Plan Template

I. Cover

II. Certification Declaration

[Required certification, with language specified by the Consent Decree, signed by a responsible official of SAWS]

III. Table of Contents

[List of sections, tables, figures and appendices included in this report]

IV. Acronyms and Abbreviations

[Definitions of abbreviations and acronyms included in this report]

V. Introduction

A. Purpose

This Plan was prepared and submitted pursuant to Paragraph 41 of the Consent Decree.

B. Regulatory Requirements

This Plan summarizes SAWS recommended Capacity Remedial Measures that have been prioritized and selected in accordance with Appendix D to address verified Capacity Constraints in the SAWS WCTS that cause or significantly contribute to Capacity-related SSOs. This Plan describes SAWS plans to implement the selected Capacity Remedial Measures on a balanced annual basis during the remaining term of this Decree. SAWS has prioritized and selected these Capacity Remedial Measures based on appropriate factors reflected in Paragraph 41 and in Appendix D of the Consent Decree and in accordance with the requirements of Paragraph 8 of the Decree. The implementation time-frames in this Plan reflect practical planning requirements such as those stated in Paragraph 41 of the Consent Decree.

Appendix G
Capacity Remedial Measures Plan Template

VI. Summary of Capacity Assessment Summary Report

[Brief summary of the Capacity Assessment Summary Report and how it relates to this Plan.

VII. Remedial Measures Alternatives Analysis

A. Guidelines for Alternative Analysis

The Plan for Capacity Remedial Measures follows SAWS completion of the Capacity Remedial Measures Alternatives Analysis as described in Paragraph 40 and in Appendix D of the Consent Decree

B. Remedial Measures Alternatives Analysis Results

[Provide a brief description of the guidelines used for performing alternatives analysis; consistent with Capacity Assessment and Remediation Process and Guidelines Appendix. Include a description of guidelines used to select continued monitoring results.]

Results of Remedial Measures Alternatives Analyses

Remedial Measures Alternatives Analysis Result *	Number of Potential Capacity Constraints
Re-route a portion of upstream wastewater flows	X
Reduce flows entering the WCTS	X
Reduce inflow	X
Reduce infiltration	X
Increase conveyance capacity	X
Upstream flow detention facilities	X
Continued monitoring	X
Other (Specify)	X
Totals:	**X**

* Note: Approach for actual implementation may be different than alternatives analyses result pursuant to Paragraph 42 and Appendix D of the Consent Decree. Some Capacity Constraints may require more than one remedial measure technique. The predominant remedial measure technique will prevail for reporting purposes.

C. Map of Alternatives Analysis Results

[Include a color coded map showing the location of each type of result.]

Appendix G
Capacity Remedial Measures Plan Template

VIII. Remediation Completed

A. Remedial Measures Progress

[Summarize the mileage for which Capacity Remedial Measures have been completed prior to submittal of this report.]

Completed Remedial Measures

	Remedial Measure Technique	Phase I	Phase II	Other	Total
Large Diameter Sewer Mains (miles)[1]	Re-route a portion of upstream wastewater flows				
	Reduce flow entering WCTS				
	Reduce inflow				
	Reduce infiltration				
	Increase conveyance capacity				
	Upstream flow detention facilities				
	Other (specify)				
Small Diameter Sewer Mains (miles)[1]	Re-route a portion of upstream wastewater flows				
	Reduce flow entering WCTS				
	Reduce inflow				
	Reduce infiltration				
	Increase conveyance capacity				
	Upstream flow detention facilities				
	Other (specify)				
Manholes (number)	Replace				
	Rehabilitate				
	Repair				
Note 1: Full pipe length is included in mileage					
Note 2: Some Capacity Constraints may require more than one remedial measure technique. The predominant remedial measure technique will prevail for reporting purposes.					

B. Map of Remedial Measures Completed

[Include a color coded map for Phase I, a map for Phase II, and another map for Other completed remediation by remediation method and asset type (small diameter pipe, large diameter pipe, and manholes) that identifies and distinguishes between replaced and repaired manholes in Phase I and Phase II of the Early Action Program.]

Appendix G
Capacity Remedial Measures Plan Template

IX. Remedial Measures Plan

A. Anticipated Remediation Timeframes

[Summarize target remediation quantities for completion each year. Include a list of Lift Stations that require capacity upgrades per the Remedial Measures Plan.]

Anticipated Remediation Timeframes

	Remedial Measure Technique	Calendar Year X	Calendar Year X	Calendar Year X	Calendar Year X	Total
Large Diameter Sewer Mains (Number of constraints addressed)	Re-route a portion of upstream wastewater flows					
	Reduce flow entering WCTS					
	Reduce inflow					
	Reduce infiltration					
	Increase conveyance capacity					
	Upstream flow detention facilities					
	Other (specify)					
Small Diameter Sewer Mains (Number of constraints addressed)	Re-route a portion of upstream wastewater flows					
	Reduce flow entering WCTS					
	Reduce inflow					
	Reduce infiltration					
	Increase conveyance capacity					
	Upstream flow detention facilities					
	Other (specify)					
Manholes (number)	Replace					
	Rehabilitate					
	Repair					
Note 1: SAWS may make day-to-day operational changes to Remedial Measures consistent with the Consent Decree, including Appendices C and D of the Consent Decree.						
Note 2: Some Capacity Constraints may require more than one remedial measure technique. The predominant remedial measure technique will prevail for reporting purposes.						

Appendix G
Capacity Remedial Measures Plan Template

B. Maps of Anticipated Remediation Timeframe

[Include a color coded map for each year identifying the capacity constraints and the remedial measure method that will be utilized to address each capacity constraint.]

C. Remediation Project List

Remediation Project List

Project Name	Project Miles	Completion Date	For Large Diameter Pipes, Schedule Justification for Completion Date After 4.5 Years from EPA Approval of Remedial Measures Plan (Pursuant to Paragraph 42 of the Consent Decree)

Appendix G
Annual Report Template

I. Cover

II. Certification Declaration

[Required certification, with language specified by the Consent Decree, signed by a responsible official of SAWS]

III. Table of Contents

[List of sections, tables, figures and appendices included in this report]

IV. Acronyms and Abbreviations

[Definitions of abbreviations and acronyms included in this report]

V. Introduction

A. Purpose

This Report was prepared and submitted pursuant to Paragraph 52 of the Consent Decree.

B. Regulatory Requirements

This Report summarizes activities completed during the previous calendar year for the following requirements in Section V of the Consent Decree: Early Action Program, Condition Assessment, Condition Remedial Measures, Capacity Assessment, Capacity Remedial Measures, Lift Station Rehabilitation and Elimination Program, Force Main Assessment Program, CMOM Program (including Private Laterals) and Water Quality Program.

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Annual Report Template

VI. Early Action Program

Phase I Early Action Program Remediation

Asset Description	Completed in Calendar Year X	Cumulative Completed [2]
Small Diameter Gravity Sewer (Miles)[1]	X	X
Large Diameter Gravity Sewer (Miles)[1]	X	X
Manholes (Number)	X	X
Note 1: Full pipe length is included in mileages.		
Note 2: Includes all work completed since xx/xx/xx.		

Status of Phase I Multi-Year Large Diameter Projects

Project Name	Description of Status

Phase II Early Action Program Remediation

Asset Description	Completed in Calendar Year X	Cumulative Completed [2]
Small Diameter Gravity Sewer (Miles)[1]	X	X
Large Diameter Gravity Sewer (Miles)[1]	X	X
Manholes (Number)	X	X
Note 1: Full pipe length is included in mileages.		
Note 2: Includes all work completed since xx/xx/xx.		

Status of Phase II Multi-Year Large Diameter Projects

Project Name	Description of Status

VII. CMOM

A. SSO Reporting

[Reference attached SSO documentation pursuant to Paragraph 12.c and 12.d of the Consent Decree]

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Annual Report Template

B. Fats, Oils, and Grease Program

[Report pursuant to Paragraph 52.b.ii of the Consent Decree]

Inspections and Enforcements Actions in Calendar Year X

Number of Permitted Food Service Establishments	Number of Inspections	Number of Enforcement or Compliance Assistance Actions
XX	XX	XX

C. Sewer Cleaning

[Report pursuant to Paragraph 52.b.iii of the Consent Decree]

Small Diameter System-Wide Cleaning Program Status in Calendar Year X

[This mileage includes Repeat Cleaning Program pursuant to Paragraph 14.b of the Consent Decree.]

Total Small Diameter Miles	Miles Cleaned in Calendar Year X	% Cleaned in Calendar Year X	% Required per Calendar Year
XX	XX	XX	12%

Small Diameter System-Wide Cleaning Program Cumulative Status

Unique Small Diameter Cleaning Completed – Year X Through Year X

	Unique Small Diameter Cumulative Percent Completed
January 1, 2009 through Date of Lodging	X
January 1, 2009 through Year 1	X
...	X
January 1, 2009 through Year 10	X

Appendix G
Annual Report Template

Large Diameter Cleaning Program Status

Total Large Diameter Miles	Miles Cleaned in Calendar Year X	% Cleaned in Calendar Year X
XX	XX	XX

Large Diameter Cleaning Program Cumulative Status

Unique Large Diameter Cleaning Completed – Year X Through Year X

	Unique Large Diameter Cumulative Percent Completed
January 1, 2009 through Date of Lodging	X
January 1, 2009 through Year 1	X
...	X
January 1, 2009 through Year 10	X

D. Private Laterals

[Report pursuant to Paragraphs 12.d,17, and 52 of the Consent Decree]

VIII. Condition Assessment

A. Gravity Sewer Main Inspection Map

[Include a map showing the location of the inspections. The map will differentiate between inspections completed during the calendar year reported in the annual report and inspections completed prior to the calendar year reported in the annual report. Inspections completed prior to the calendar year reported in the annual report will include inspections after January 1, 2009 for small diameter pipe and after inception of the large diameter inspection program in 2005 for large diameter pipe.]

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Annual Report Template

B. Gravity Sewer Main Inspection Status

Gravity Sewer Main Inspection Completed Through Calendar Year X

Asset Description	Method	Miles of Inspections Required Under Consent Decree[2]	Miles Completed Prior to Date of Lodging[1,2]	Miles Completed in Calendar Year X[1]	Miles Completed since Date of Lodging[2]	Cumulative Miles of Inspections Completed[2]	Cumulative % Complete
Small Diameter Gravity Sewer - Concrete Pipe and Clay Pipe Installed Prior to 1973	CCTV or other approved techniques	XX	XX	XX	XX	XX	XX
Small Diameter Gravity Sewer - Clay Pipe Installed from 1973 through 1982	Pole Camera, CCTV, or other approved techniques	XX	XX	XX	XX	XX	XX
Small Diameter Gravity Sewer - Other Pipe	Visual Inspection, Pole Camera, CCTV, or other approved techniques	XX	XX	XX	XX	XX	XX
Large Diameter Gravity Sewer	CCTV and other approved techniques	XX	XX	XX	XX	XX	XX

Note 1: Includes small diameter gravity sewer inspections since January 1, 2009 and large diameter gravity sewer inspections since inception of the large diameter program in 2005.

Note 2: Full pipe length is included in mileages.

C. Manhole Inspection Map

[Include a map showing the location of the inspections. The map will differentiate between inspections completed during the calendar year reported in the annual report and inspections completed prior to the calendar year reported in the annual report. Inspections completed prior to the calendar year reported in the annual report will include inspections after January 1, 2009.]

D. Manhole Inspection Status

Manhole Inspection Summary

Inspection Method	Manhole Inspections to be Completed Under Consent Decree	Inspected Prior to Date of Lodging[1]	Inspected in Calendar Year X	Inspected Since Date of Lodging	Cumulative Inspections Completed[1]	Cumulative % Complete[1]
Visual Inspection	XX	XX	XX	XX	XX	XX
Note 1: Includes manhole inspections since January 1, 2009.						

E. Condition Categorization Summary

Condition Categorization Summary

Condition Category	Miles of Small Diameter Sewer Mains [1]	Miles of Large Diameter Sewer Mains [1]	Number of Manholes
Category A – Very Good	XX	XX	XX
Category B – Good	XX	XX	XX
Category C – Fair Condition	XX	XX	XX
Category D – Poor	XX	XX	XX
Category E – Very Poor	XX	XX	XX
Note 1: Full pipe length is included in mileages.			

F. Map of Condition Categories

[Include a map showing the location of the categorized assets for assets categorized during the calendar year reported in the annual report.]

G. Condition Assessment Guidelines

[Reference Consent Decree Appendix C, Condition Assessment and Remediation Process and Guidelines Appendix. Brief description of how SAWS applied these guidelines to develop the quantities of structural defects selected for Remedial Measures Alternative Analysis, Monitoring (CMOM) and Maintenance Analysis (CMOM).]

H. Condition Assessment Results During Calendar Year X

Condition Assessment Result	Miles of Small Diameter Sewer Mains [1]	Miles of Large Diameter Sewer Mains [1]	Number of Manholes
Remedial Measures Alternatives Analysis	XX	XX	XX
Monitoring (CMOM)	XX	XX	XX
Maintenance Analysis (CMOM)	XX	XX	XX
Note 1: Full pipe length is included in mileages.			

I. Map of Condition Assessment Results

[Include a map showing the location of the results for results determined during the calendar year reported in the annual report.]

IX. Condition Remedial Measures

A. Status of Multi-Year Large Diameter Condition Remediation

Project Name	Description of Status

B. Condition Remediation Completed

[Summarize the mileage of gravity sewer mains and number of manholes for which Condition Remedial Measures have been completed (Not including Early Action Program work)]

Remediation Completed

	Miles of Small Diameter Gravity Sewer Main [1]	Miles of Large Diameter Gravity Sewer Main [1]	Number of Manholes
Completed in Calendar Year X	X	X	X
Note 1: Full pipe length is included in mileage			

[After EPA approval of the Condition Remedial Measures Plan, include a description of day-to-day operational changes to Remedial Measures consistent with of the Consent Decree and Appendices C and D of the Consent Decree.]

C. Map of Condition Remedial Measures Completed

[Include an overview map of remedial measures completed. The map will differentiate between remedial measures completed during the calendar year reported in the annual report and remedial measures completed pursuant to the consent decree prior to the calendar year reported in the annual report.]

D. Asset Information for Condition Remedial Measures Completed During Calendar Year X

[Attach the following information to this report:

a. The asset identification number and type of asset;
b. Whether the asset was rehabilitated, repaired or replaced;
c. The length of the sewer line at issue, if applicable;
d. The pipe material, if applicable;
e. The diameter of the pipe, if applicable;
f. The manhole type, if applicable;
g. The original installation date of the asset;
h. Project name]

X. Capacity Assessment

A. Wet-Weather Related SSO Categorization

1. Guidelines

[Reference Consent Decree Appendix D, Capacity Assessment and Remediation Process and Guidelines Appendix. Include the range of dates for historical SSOs that this section of the Annual Report covers. Include a summary of the activities performed to address Category C SSOs.]

2. Wet-Weather SSO Categorization Summary

Wet Weather SSO Categorization for Calendar Year X

Category	Number of SSOs
Category A – Most likely a capacity-related SSO	X
Category B – Most likely maintenance-related	X
Category C – Clearly not a capacity related SSO	X
Total	**X**

3. Wet-Weather SSO Categorization Summary Map

[Include a map showing the location of the wet-weather SSO categories for SSOs categorized during the calendar year reported in the annual report.]

B. System-wide Hydraulic Modeling Evaluation

1. Model Maps

[Include a map showing the location of pipes in the model.]

2. Model results identifying potential Capacity Constraints

[Provide a summary of any model results that identify potential Capacity Constraints, including any lift station results]

C. Prioritization of Potential Capacity Constraints

[Provide a brief description of how SAWS used Consent Decree Appendix D to prioritize potential Capacity Constraints, consistent with the Capacity Assessment and Remediation Process and Guidelines Appendix].

Potential Capacity Constraints Summary

Category	Number of Potential Capacity Constraints Identified in Calendar Year X
Priority 1 – Category A SSO per Wet-Weather SSO Categorization and where model also predicts a SSO	X
Priority 2 – Where model predicts SSO, but with no observed SSO. Or a Category A SSO per Wet-Weather SSO Categorization, but model does not predict a SSO.	X
Priority 3 – Where model predicts Hydraulic Grade Line (HGL) near ground elevation	X
Priority 4 – Category B SSO per Wet-Weather SSO Categorization	X
Priority 5 – Where pipe design capacity is exceeded for sustained 60 minutes or more but the HGL is not near the ground elevation	X
Total	**X**

1. Map of Potential Capacity Constraints

[Include a map showing the location of potential capacity constraints identified during the calendar year reported in the annual report.]

XI. Field Investigations of Potential Capacity Constraints

A. Field Investigation Status

Completed Field Investigations

Technique	Number of Completed Field Investigations in Calendar Year X				
	Priority 1	Priority 2	Priority 3	Priority 4	Priority 5
Flow Metering	X	X	X	X	X
Smart Covers	X	X	X	X	X
Chalking	X	X	X	X	X
Visual Inspection	X	X	X	X	X
Other *(if applicable)*	X	X	X	X	X
Monitor in Future per Capacity Assessment and Remediation Process and Guidelines Appendix (CMOM)	X	X	X	X	X
Total	**X**	**X**	**X**	**X**	**X**

B. Map of Completed Field Investigations

[Include a map showing the location of each field investigation.]

XII. Capacity Remediation

A. Status of Multi-Year Large Diameter Capacity Remediation

Project Name	Description of Status

B. Capacity Remediation Completed

[Summarize the mileage for which Capacity Remedial Measures have been completed (Not including Early Action Program work)]

	Miles of Small Diameter Gravity Sewer Main [1]	Miles of Large Diameter Gravity Sewer Main [1]
Completed in Calendar Year X	X	X
Note 1: Full pipe length is included in mileage		

[After EPA approval of the Condition Remedial Measures Plan, include a description of day-to-day operational changes to Remedial Measures consistent with of the Consent Decree and Appendices C and D of the Consent Decree.]

C. Map of Capacity Remedial Measures Completed

[Include an overview map of remedial measures completed. The map will differentiate between remedial measures completed during the calendar year reported in the annual report and remedial measures completed pursuant to the consent decree prior to the calendar year reported in the annual report.]

D. Asset Information for Completed Capacity Remedial Measures

[Attach the following information to this report:

a. The asset identification number and type of asset;
b. Whether SAWS addressed the Capacity Constraint through pipe rehabilitation/replacement, increased conveyance capacity, increased storage, or other Capacity Remedial Measures;
c. The length of the sewer line at issue, if applicable;
d. The pipe material, if applicable;
e. The diameter of the pipe, if applicable;
f. The original installation date of the asset at issue;
g. Project name]

E. Potential Capacity Constraints Removed from Field Investigation Program

[Report pursuant to Consent Decree paragraph 52.f.viii.]

XIII. Remedial Measures Coordinated Between Capacity and Condition Remedial Measures

[Description of Remedial Measures that were coordinated between Condition and Capacity Remedial Measures]

XIV. Lift Station Rehabilitation and Elimination Program

[Report updates to Consent Decree Appendix E pursuant to paragraphs 44 and 52.g of the Consent Decree.]

XV. Force Main Assessment Program

[Report pursuant to requirements of paragraphs 46 and 52.h of the Consent Decree.]

Force Main Inspection Progress Summary

	Inspections to be Completed Under Consent Decree	Inspections Completed in Year X	Cumulative Inspections Completed	Cumulative % Complete
Number of Force Mains Visually Inspected	XX	XX	XX	XX

Force Main Condition Assessment Summary

Condition Assessment Result	Miles of Force Mains
Remedial Measures Alternatives Analysis	XX
Monitoring (CMOM)	XX
Maintenance Analysis (CMOM)	XX

Appendix G
Annual Report Template

Force Main Remedial Measures Completed in Calendar Year X

Miles Completed in Calendar Year X
XX

XVI. Water Quality Program

[Report pursuant to Consent Decree paragraph 52.i]

XVII. Work Completed in Low Income Areas

[Report pursuant to Consent Decree paragraph 52.j. Include the following:

a. *Narrative summary of miles of gravity sewer main inspected, cleaned or remediated in low income areas per summaries in Sections VI, VII.C, VIII.B, IX.B, and XII.B herein;*
b. *All maps required by this Annual Report Template shall show the low income areas in which work was completed using a map consistent with Attachment 1 hereto for the work categories specified in Consent Decree paragraph 52.j.]*

XVIII. Modifications

[Include a summary of written agreements pursuant to Consent Decree paragraph 110 and other changes made pursuant to Consent Decree paragraph 111.]

Appendix G
Annual Report Template

Appendix for

SSO Documentation

Appendix G
Annual Report Template

Appendix for Updated

Lift Station Table (Consent Decree Appendix E)

Appendix for

Asset Information for Completed Condition Remedial Measures

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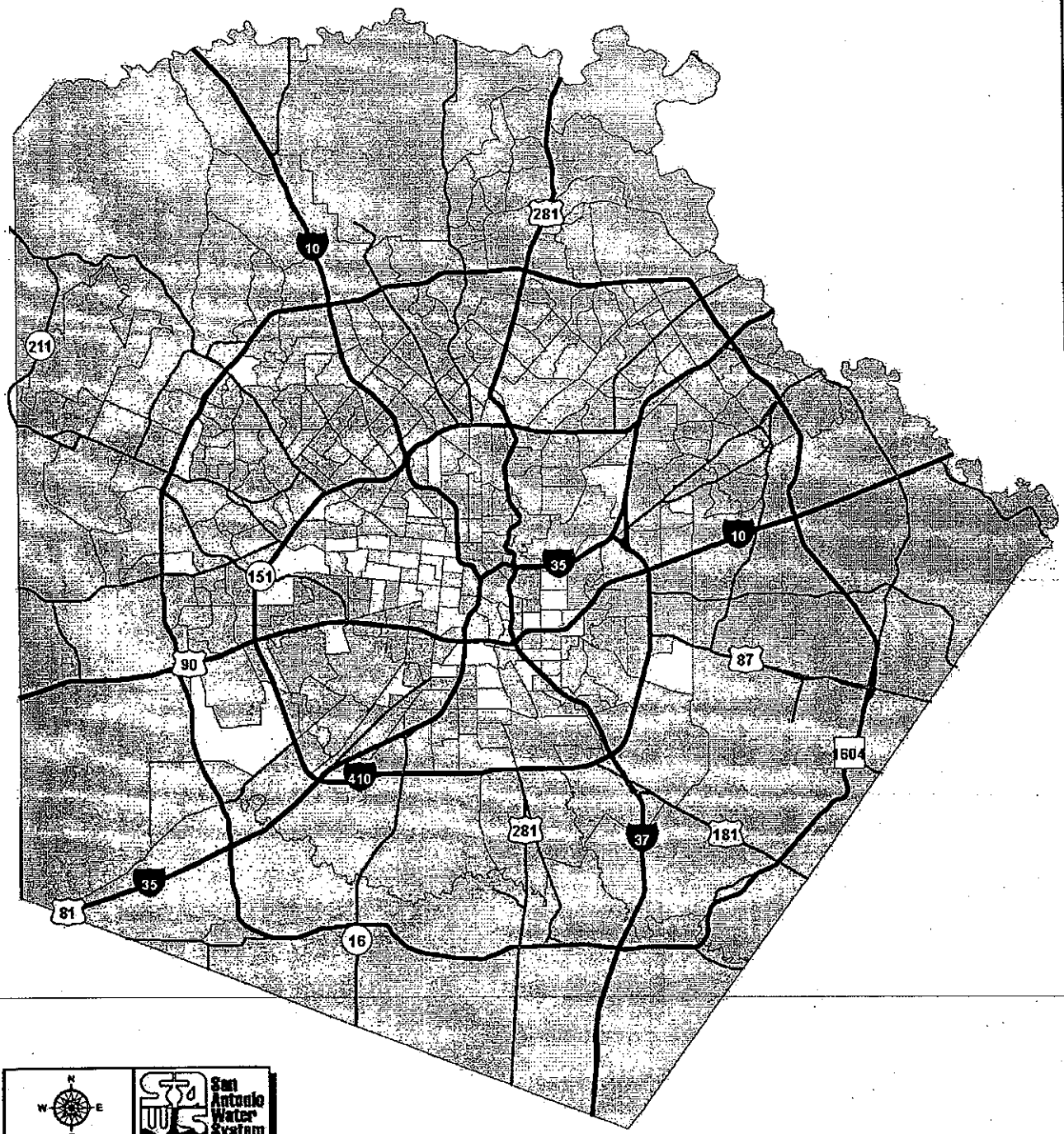
Annual Report Template

Appendix for

Asset Information for Completed Capacity Remedial Measures

SAWS Census Tracts Estimated Below Poverty Level

Annual Report Template Attachment 1



N W E S

San Antonio Water System

Date: May 03, 2013 GIS Division

This utility map is for reference only. The information may not represent what actually has been constructed. S.A.W.S explicitly disclaims any representation of the accuracy of the information and assumes no liability for any errors, omissions, or inaccuracies in the map regardless of how caused. Field verification should be performed as necessary. S.A.W.S. prohibits illegal reproduction or sale of this document. This utility map may not under any circumstances, be copied, reproduced or published in any format or media, or transferred to another without written permission of the San Antonio Water System.

Source: 2010 ACS 5 year dataset C17002

SAWS Residential Accounts Estimated at Below 125% Poverty

Qualifying Census Tracts

APPENDIX H