

STATE OF INDIANA

INDIANA UTILITY REGULATORY COMMISSION

PETITION OF CWA AUTHORITY, INC. FOR)
(1) AUTHORITY TO INCREASE ITS)
RATES AND CHARGES FOR)
WASTEWATER UTILITY SERVICE IN)
THREE PHASES AND APPROVAL OF NEW)
SCHEDULES OF RATES AND CHARGES)
APPLICABLE THERETO; (2) APPROVAL OF)
A LOW-INCOME CUSTOMER ASSISTANCE)
PROGRAM; AND (3) APPROVAL OF)
CERTAIN CHANGES TO ITS GENERAL)
TERMS AND CONDITIONS FOR)
WASTEWATER SERVICE.)

CAUSE NO. 45151

REDACTED TESTIMONY

OF

JAMES T. PARKS – PUBLIC’S EXHIBIT NO. 4

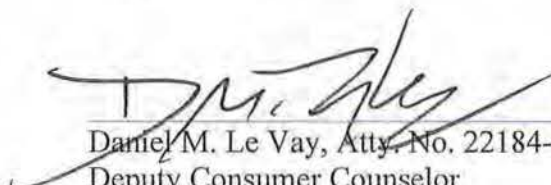
ON BEHALF

OF

THE INDIANA OFFICE OF UTILITY CONSUMER COUNSELOR

JANUARY 25, 2019

Respectfully Submitted,


Daniel M. Le Vay, Atty. No. 22184-49
Deputy Consumer Counselor

CERTIFICATE OF SERVICE

This is to certify that a copy of the foregoing *Office of Utility Consumer Counselor's Redacted Testimony of James T. Parks* has been served upon the following counsel of record in the captioned proceeding by electronic service on January 25, 2019.

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**REDACTED TESTIMONY OF OUCC WITNESS
JAMES T. PARKS
CAUSE NO. 45151
CWA AUTHORITY, INC.**

I. INTRODUCTION

1 **Q: Please state your name and business address.**

2 A: My name is James T. Parks, P.E., and my business address is 115 W. Washington
3 Street, Suite 1500 South, Indianapolis, IN 46204.

4 **Q: By whom are you employed and in what capacity?**

5 A: I am employed by the Office of Utility Consumer Counselor ("OUCC") as a Utility
6 Analyst II in the Water/Wastewater Division. My qualifications and experience are
7 described in Appendix A.

8 **Q: What is the purpose of your testimony?**

9 A: The purpose of my testimony is to review the prudence and cost reasonableness of
10 (1) the significant capital additions CWA Authority, Inc. ("CWA Authority,"
11 "Petitioner" or "Company") proposes to make through April 2022; and (2) some of
12 the planned capital additions. I explain that Petitioner has failed to justify the need
13 and costs associated with many of its proposed capital projects. I explain why the
14 OUCC opposes funding some of Petitioner's capital projects and aspects of
15 Petitioner's capital program for ratemaking purposes based on inflated cost
16 estimates and lack of project support documentation. I also discuss CWA's
17 implementation of the Septic Tank Elimination Program ("STEP") it acquired from
18 the City of Indianapolis. More specifically, I note its recent decision to no longer
19 install gravity systems, electing instead to install low pressure sewer systems

1 ("LPSS") requiring individual grinder pumps. I recommend CWA be responsible
2 for maintaining the grinder pumps and replacing them when they reach the end of
3 their useful lives.

4 **Q: Please describe the review and analysis you conducted for your testimony.**

5 A: I reviewed the Petition and the testimonies of Petitioner's witnesses Mark C. Jacob,
6 Jeff Willman and Jeffrey Harrison. I reviewed Petitioner's Annual Reports filed
7 with the Indiana Utility Regulatory Commission ("Commission" or "IURC"). I
8 assisted in writing discovery requests and reviewed Petitioner's responses.
9 Through discovery I sought to understand how Petitioner justified its proposed
10 capital improvements, how these projects were developed, whether Petitioner
11 identified and analyzed any alternatives, and how Petitioner estimated project costs.
12 I also reviewed discovery responses CWA provided in Cause No. 44685 -- its last
13 rate case. I reviewed various documents, which I refer to in my testimony and
14 which I have attached to my testimony and listed in Appendix B.

II. CWA AUTHORITY'S WASTEWATER SYSTEM CHARACTERISTICS

15 **Q: Please briefly describe CWA Authority's operations.**

16 A: CWA is an Indiana nonprofit corporation created specifically to acquire ownership
17 of wastewater utility assets owned by the City of Indianapolis ("City").¹ On August
18 26, 2011, CWA Authority Inc. (CWA) acquired the Indianapolis' wastewater utility
19 system. Major collection system assets include 3,477 miles of sanitary sewers,

¹ The Interlocal Cooperation Agreement between CWA Authority, Inc., the City of Indianapolis, and the Indianapolis Sanitary District was approved by the Commission in Cause No. 43936 on July 13, 2011.

1 combined sewers, force mains, and interceptor sewers, 64,000 manholes, 286 lift
2 stations, 130 combined sewer overflow (“CSO”) outfalls, CSO drop shafts and ten
3 miles of CSO storage tunnels through which raw sewage and combined sewage
4 flows are collected, captured and conveyed to the Belmont and Southport
5 wastewater treatment plants (“WWTPs”).

6 According to CWA Authority’s most recent annual report filed with the
7 IURC, in 2017 Petitioner provided wastewater utility service to 244,524 customers
8 in all parts of Marion County, except for the Town of Speedway and the Town of
9 Cumberland. CWA also provides wholesale wastewater disposal services to seven
10 Satellite Communities.² Based on population data for Marion County and
11 Greenwood, I estimate CWA Authority serves approximately 920,000 people.³

12 Petitioner’s Belmont WWTP and Southport WWTP have a combined
13 maximum treatment capacity of 550 million gallons per day (“MGD”). In 2017,
14 Petitioner reported adding 7.45 miles of new gravity sewers⁴ and nearly three times
15 more new force mains than gravity sewers or 21.9 miles. These force mains mainly
16 consisted of 2-inch and 3-inch HDPE pipes (87%) resulting from Petitioner’s
17 decision to construct only low pressure sewer systems (“LPSS”) using individual
18 grinder pumps for its Septic Tank Elimination Program (“STEP”) instead of

² 2017 Annual Report to the IURC, page S-1. Metered customers included 212,777 residential (87% of the total), 16,918 commercial (7%), 315 industrial (0.1%), and 2,836 multiple-family (1%). CWA also served 7,831 residential and 3,822 flat rate customers, and all or portions of seven Satellite communities (City of Beech Grove, Ben Davis Conservancy District, City of Greenwood, Hamilton Southeastern Utilities, Inc., City of Lawrence, Tri-County Conservancy District, and the Town of Whitestown).

³ Population data from the Indiana Business Research Center, STATS Indiana website.

⁴ 83% of the new gravity sewers were 8-inch PVC pipe (minimum allowable diameter).

1 conventional gravity sewers.

2 **Q: What are CWA Authority's customer growth characteristics?**

3 A: Over the last five years, Petitioner's customer base grew from 229,028 customers
4 at December 31, 2012 to 244,524 customers at December 31, 2017 – a growth rate
5 of approximately 1.3% per year. Residential customers accounted for 84% of this
6 growth, of which I estimate about 44% was due to connections through the STEP.⁵

7 **Q: Please provide an overview of Mr. Jacob's testimony.**

8 A: Mr. Jacob described CWA's capital program during the test year ending May 30,
9 2018 and Period 1 (August 2018 to July 2019). In addition he described capital
10 needs during the three-year period beginning August 1, 2019 and ending July 31,
11 2022, which he calls the "Capital Investment Requirements Period" (the "CIRP").
12 He described CWA's reduction in capital funding needs beyond the CIRP as CWA
13 completes costly Consent Decree projects.⁶ He indicated the CIRP is the period
14 during which the rates will be in effect.

15 Mr. Jacob testified that most Consent Decree projects have been completed
16 and that CWA is on schedule to meet the prescribed final completion date of
17 December 31, 2025.⁷ He added that CWA is approximately \$400 million under
18 budget on the completion of the Consent Decree projects (in 2016 dollars),⁸ but he

⁵ Calculated as 13,500 existing homes served by new sewers installed under the STEP program, of which 50% actually connected to the sewers. See Direct Testimony of Mark C. Jacob, page 18, lines 11-12.

⁶ Direct Testimony of Mark C. Jacob, page 3, lines 13-22. The final completion date is when all 64 combined sewage overflow ("CSO") Control Measures achieve full operation per the terms under the Consent Decree with the US EPA and the Indiana Department of Environmental Management ("IDEM").

⁷ *Id.*, page 6, lines 4-5.

⁸ *Id.*, page 29, lines 20-21.

1 did not demonstrate how these savings were calculated. Mr. Jacob also testified
2 that all elements of the Consent Decree are in compliance, including all aspects of
3 the Control Measures set forth in the Long Term Control Plan ("LTCP").⁹

4 Mr. Jacob also testified about CWA's decision to only install low pressure
5 sewer systems ("LPSS") for its STEP program instead of gravity sanitary sewers
6 because of CWA's value engineering efforts that have lowered CWA's STEP costs.
7 He described CWA's plans to spend \$6.3 M annually under STEP to connect over
8 300 homes per year.¹⁰ Mr. Jacob discusses efficiencies CWA has achieved in
9 completing capital projects.

10 **Q: Please describe CWA's planned capital projects.**

11 A: Mr. Jacob listed 108 capital projects that Petitioner plans to construct through
12 2024¹¹ by providing project names, project categories, project start and completion
13 years, estimate class, and estimated total project costs in a two-page spreadsheet.¹²
14 Petitioner estimates the costs for these capital additions at \$ [REDACTED]¹³ with
15 just six major CSO control program projects required under CWA's Consent
16 Decree accounting for 87% of total costs [REDACTED]. (See Confidential
17 Attachment MCJ-6.)

⁹ *Id.*, page 7, lines 18-20.

¹⁰ *Id.*, page 16, lines 1-6. CWA's revised STEP is a reduction from prior years when CWA planned to spend \$12 M annually to connect 800 homes per year. Mr. Korlon L. Kilpatrick II testified CWA assumes it will connect 337 STEP homes to CWA's sewer system per year over the next eight years. See Korlon L. Kilpatrick II Direct Testimony, pages 52 and 53.

¹¹ One project – Sludge Line Replacement (Project No. 92MW00357) is slated to be completed by 2026.

¹² Direct Testimony of Mark Jacob, Attachment MCJ-6 (unredacted)

¹³ *Id.*

1 **Q: What is the total capital cost for these projects included in this Cause?**
 2 A: Mr. Jacob testified the value of the additions to be funded over a three period from
 3 August 2019 to July 2022 is \$589.38 million, for which Petitioner seeks Extensions
 4 and Replacements (“E&R”) revenue funding of \$228M and \$361.38M of new debt
 5 funding.¹⁴ CWA’s requested funding by major categories is shown in Table 1.

Table 1 CWA Authority, Inc. Capital Funding Plan (August 2019 to July 2022)

| Name | 2019-2020 | 2020-2021 | 2021-2022 | 3-Yr. Total |
|---------------------------|---------------|---------------|--------------|-------------|
| WW Treatment Plants | \$11,516,637 | \$16,747,559 | \$13,242,166 | 41,506,362 |
| Environmental | 140,000 | 181,667 | 385,833 | 707,500 |
| Federal Consent Decree | 160,241,648 | 159,762,254 | 136,583,333 | 456,587,235 |
| STEP Projects | 6,175,172 | 6,221,740 | 6,583,930 | 18,980,842 |
| Collection Systems | 18,158,990 | 19,620,712 | 17,008,667 | 54,788,369 |
| WW Fleet & Facilities | 2,139,150 | 2,099,667 | 2,145,333 | 6,384,150 |
| WW Technology Projects | 223,000 | 1,348,000 | 73,000 | 1,644,000 |
| Subtotal - CWA Authority | 198,594,597 | 205,981,599 | 176,022,262 | 580,598,458 |
| Subtotal - SS Allocations | 4,172,906 | 2,131,570 | 2,477,066 | 8,781,542 |
| Total Capital Program | 202,767,503 | 208,113,169 | 178,499,328 | 589,380,000 |
| Funding Sources | | | | |
| E&R (Revenue Funded) | 72,000,000 | 76,000,000 | 80,000,000 | 228,000,000 |
| Debt Funded (new) | \$130,767,503 | \$132,113,169 | \$98,499,328 | 361,380,000 |
| Total Funding | 202,767,503 | 208,113,169 | 178,499,328 | 589,380,000 |

¹⁴ Direct Testimony of John Brehm, page 40, lines 2-15. CWA has included E&R revenue funding of \$72 M (step one rates), \$76 M (step two rates) and \$80 M (step three rates) which accounts for 38.7% of capital funding over three years (August 1, 2019-July 31, 2022) with the remainder of capital funding (61.3%) to be funded with \$361,380,000 in new debt.

1 **Q: Does Mr. Jacob discuss annual capital spending levels after the three year**
2 **CIRP ends in 2021 in his testimony?**

3 **A:** Yes. Mr. Jacob testified that total E&R collection system needs will decrease from
4 the high current levels (unstated but assumed to be for the Consent Decree tunnel
5 projects as well as collection system) to approximately \$89 million annually (3.4%
6 renewal rate).¹⁵ But he notes that even at this level, “CWA’s investment levels for
7 pipelines, collections, treatment facilities and pumping would (only) be closer to
8 the median quartile of reinvestment according to a 2011 AWWA Benchmarking
9 Study” summarized in Table 2.¹⁶

Table 2 – System Renewal and Replacement (R&R) Rate (%)
2011 AWWA Benchmarking Study

| Performance Indicator | Combined Operations (Water and Wastewater) | | | |
|----------------------------|--|--------|-----------------|-------------|
| | Top Quartile | Median | Bottom Quartile | Sample Size |
| WW pipelines & collections | 20.0% | 3.7% | 1.8% | 32 |
| WWTP & Pumping | 24.5% | 5.8% | 1.5% | 43 |

10 Mr. Jacob pointed out that the AWWA Study indicates the top quartile utilities are
11 renewing or replacing pipeline and collection system infrastructure at a rate of 20%
12 per year and treatment plant and pumping facilities at a rate of 24.5% per year.

¹⁵ This implies that CWA’s total present worth of renewal and replacement needs for its collection system are \$2.618 billion calculated as \$89 M divided by 3.4% equals \$2.618 B.

¹⁶ 2011 Benchmarking – Performance Indicators for Water and Wastewater Utilities: Survey Data and Analyses Report, American Water Works Association, 2013.

1 **Q: Do you believe the top quartile utilities were actually replacing pipeline and**
2 **collection system infrastructure at a 20% annual rate?**

3 A: No. This is an unheard of renewal rate that must be caused by some kind of
4 statistical, data, or calculation error in the 2011 AWWA Study. If extended to
5 CWA's sewer system, this would imply that for CWA to be in the top quartile of
6 utilities it would be replacing over 685 miles of its total 3,429 miles of sewers each
7 year at a cost approaching \$0.75 billion annually.¹⁷ This would be 16 times CWA's
8 current non-Consent Decree E&R investments of \$45.6 million. Replacing
9 treatment and pumping facilities at the even higher reported 24.5% top quartile rate
10 would mean CWA would replace all its treatment plant and lift station assets in just
11 four years. These are all long lived assets with service lives of 50 to 100 years per
12 the same AWWA Benchmarking Study. These 2011 renewal and replacement rates
13 should not be used to assess CWA's replacement budgets.¹⁸

14 **Q: What is the purpose of Mr. Jacob's testimony regarding reinvestment levels**
15 **after the Consent Decree projects are completed?**

16 A: I interpret his testimony to be a notice to the Commission that CWA is currently
17 deferring needed maintenance, replacements, and underinvesting in its other assets
18 (non-Consent Decree projects). Mr. Jacob testifies as follows regarding the
19 adequacy of CWA's current investment levels compared to rates in the AWWA
20 Study:

¹⁷ Based on an assumed sewer replacement cost of \$200 per lineal foot.

¹⁸ The 2011 AWWA Benchmarking Study notes that the information represents the aggregate data for System renewal and Replacement from responses and that the top quartile does not indicate preferred replacement.

1 However, we cannot continue to invest in the system at current
2 levels without increasing risks of negative consequences. As stated
3 above, although CWA has increased investments within the
4 collection system comparative to the City, CWA currently is
5 investing closer to the bottom quartile of the previously mentioned-
6 AWWA study with respect to non-Consent Decree E&R, due to the
7 significant investments needed to complete the Consent Decree
8 projects within the prescribed schedules. However, this level of
9 reinvestment in the collection system is not prudent over the long
10 term and would lead to increased degradation, which could result in
11 environmental violations, sewer failures, public safety risks,
12 capacity limitations leading to restricted development, and treatment
13 plant limitations.¹⁹

- 14 **Q: Does AWWA periodically update its Benchmarking Study?**
15 A: Yes. AWWA updated the Study last year reporting lower renewal and replacement
16 rates as summarized in Table 3.

**Table 3 – Aggregate Data for System Renewal and Replacement Fund Allocation (%)
2018 AWWA Benchmarking Study**

| Performance Indicator | Combined Utilities (Wastewater Operations) | | | |
|--------------------------|--|--------|-----------------|--------------------------------|
| | Top Quartile | Median | Bottom Quartile | Sample Size (No. of Utilities) |
| Wastewater collection | 3.0% | 1.5% | 0.5% | 39 |
| Wastewater pump stations | 5.7% | 3.1% | 1.6% | 32 |
| Wastewater treatment | 3.4% | 2.3% | 0.9% | 34 |

¹⁹ Direct Testimony of Mark C. Jacob, page 40, lines 12-22.

1 **Q: How does CWA's proposed \$89 million reinvestment level (3.4% renewal rate)**
2 **compare to the 2018 AWWA benchmarking rates?**

3 A: Comparing CWA's proposed \$89 million reinvestment level (3.4%)²⁰ to the 2018
4 AWWA Benchmarking rates, shows that CWA would be over twice the median
5 reinvestment level for its collection system and would be solidly in the top quartile.

III. OUCC REVIEW OF SPECIFIC CAPITAL IMPROVEMENT PROJECTS

6 **Q: Which Projects did you review?**

7 A: Due to the large number of projects, it is not feasible in the time provided for the
8 OUCC to review and analyze every project CWA says it intends to complete.
9 Therefore, OUCC operational analysts selected and reviewed certain significant
10 capital projects. The selection process included the OUCC discovery questions
11 seeking information on how CWA Authority determined what improvements to
12 make and at what cost. If a project is not addressed in this testimony, it should not
13 be assumed that the OUCC agrees the project is reasonably necessary or that the
14 cost estimate is accurate. The following is a discussion of the projects we reviewed
15 and recommend the projected cost should be reduced in whole or in part. OUCC
16 witness Edward R. Kaufman discusses in his testimony how the recommendations
17 below affect the OUCC's proposed debt service or E&R revenue requirements.

A. Interplant Fiber Optic Comm – 92MT00357

18 **Q: Did CWA provide any detail on this project in its case-in-chief?**

19 A: No. The project was merely identified as "Interplant Fiber Optic Comm" on

²⁰ Direct Testimony of Mark C. Jacob, page 39, lines 12-14.

1 Column A of Attachment MCJ-6, with other columns showing single-line Project
2 Number, Project Description ("1230-WW Treatment Plants"), Project Need ("Plant
3 Rehabilitation"), Alternatives Considered ("Replacement In-Kind"), Estimated
4 Start and Completion dates, and Total Project Cost Class.

5 **Q: Did the OUCC seek additional information regarding this project?**

6 A: Yes, additional information regarding this project was sought and obtained in
7 response to OUCC DR 10-46 (Confidential Attachment JTP-8).

8 **Q: Please describe the "Interplant Fiber Optic Comm" project.**

9 A: CWA's two-page confidential narrative response (OUCC DR 10-46) for the "AWT
10 Interplant Fiber Communication" project discusses a perceived (but unsupported)

11 [REDACTED]

12 [REDACTED]

13 [REDACTED]

14 [REDACTED]

15 **Q: Were any detailed cost estimates, routing plans or other information provided**
16 **in response to OUCC DR 10-46?**

17 A: No, as noted above, the information provided was less than two pages, in narrative
18 format without any supporting detailed cost estimates, plans or other information
19 to enable a review of the project. For example, if the project presented involves the
20 installation of dedicated lines (and this is not even clear from the narrative), it might
21 be possible that CWA instead lease data lines at a lower lifecycle cost.

22 **Q: Has CWA completed any other fiber optic projects between the Southport and**
23 **Belmont wastewater plants?**

24 A: Yes. In its 2016 and 2017 IURC Annual Reports, CWA reported spending the
25 following amounts on fiber optic conduits, and cabling:

Table 4 – Fiber optics projects 2015 - 2017

| Asset Description | In Service Date | Amount |
|---|------------------------|---------------|
| Sludge pipe repl Ph 1 - 4" HDPE fiber optic conduit | 1/31/2015 | \$324,547 |
| Sludge pipe repl Ph 4 - 6" HDPE fiber optic conduit | 6/30/2015 | 19,239 |
| Belmont fiber optic backbone cabling | 6/30/2015 | \$55,433 |
| Deep Rock Tunnel-tunnel fiber optic | 12/31/17 | \$8,385,307 |
| Total 2015 - 2017 | | \$8,784,526 |

1 **Q: Should this project be approved?**

2 A: No. Based on my review of CWA’s testimony, and in light of its response to OUCC
3 discovery, CWA has not shown that the project is either reasonably necessary or
4 the most cost-effective approach to providing high-speed data communications
5 capabilities between the plants and certain portions of the collection system. I
6 recommend that the [REDACTED]²¹ cost of the project be removed from Petitioner’s
7 revenue requirement associated with its capital spending. OUCC witness Kaufman
8 discusses how this will be accomplished in his testimony.

9 **B. LS 516 Replacement – 92LS02673**

10 **Q: Did CWA provide any detail on this project in its case-in-chief?**

11 A: No. The project was merely identified as “LS 516 Replacement” on Column A of
12 Attachment MCJ-6, with other columns showing single-line Project Number,
13 Project Description (“1234-Collection Systems”), Project Need (“Collection
14 Systems Rehabilitation”), Alternatives Considered (“Replacement In-Kind”),

²¹ See Petitioner’s Confidential Attachment MCJ-6 (unredacted).

1 Estimated Start and Completion dates, and Total Project Cost Class.

2 **Q: Did the OUCC seek additional information regarding this project?**

3 A: Yes, additional information regarding this project was sought and obtained in
4 response to OUCC DR 10-46 (Confidential Attachment JTP-9).

5 **Q: Please describe the LS 516 Replacement project.**

6 A: According to the April 2018 "10 Percent Design Memorandum" prepared by Black
7 & Veatch Corporation and supplied in response to OUCC DR 10-46 [REDACTED]

8 [REDACTED]

9 [REDACTED]

10 [REDACTED]

11 [REDACTED]

12 [REDACTED]

13 [REDACTED]

14 **Q: Were any detailed cost estimates, engineering reports or other information**
15 **provided with regard to this project**

16 A: Yes. The previously mentioned, "10 Percent Design Memorandum" prepared by
17 Black & Veatch Corporation in April of 2018 was provided and assisted in the
18 OUCC's understanding and evaluation of this project.

19 **Q: Should this project be included in Petitioner's revenue requirement?**

20 A: Yes, but not at the confidential, proposed cost of [REDACTED]. Petitioner's estimated
21 costs are higher than the OUCC's cost estimate. One reason may be that for LS
22 516, Petitioner included a [REDACTED]

23 [REDACTED]

1 for [REDACTED]. See Confidential Attachments JTP-9 and JTP-10 to compare the
2 estimated costs for LS 516 and LS 511.

3 **Q: What should the cost for the LS 516 project be?**

4 A: Based both upon data from the RS Means Heavy Construction Cost Data Manual
5 (a national cost database) and information contained in the "10 Percent Design
6 Memorandum," the actual construction costs should be \$[REDACTED]. After adjusting
7 for the lower Indianapolis area construction costs ([REDACTED] of the national average),
8 inflation, a 10% contingency ([REDACTED]) and 18% non-construction costs ([REDACTED]),
9 the total project cost for the LS 516 project is [REDACTED] for purposes of establishing
10 CWA's revenue requirement.²² I recommend the difference in the project cost
11 between CWA's requested [REDACTED] and \$[REDACTED] be removed from Petitioner's
12 revenue requirement associated with its capital spending.

13 **C. LS 511 Replacement – 92LS02675**

14 **Q: Did CWA provide any detail on this project in its case-in-chief?**

15 A: No. The project was merely identified as "LS 511 Replacement" on Column A of
16 Attachment MCJ-6, with other columns showing single-line Project Number,
17 Project Description ("1234-Collection Systems"), Project Need ("Collection
18 Systems Rehabilitation"), Alternatives Considered ("Replacement In-Kind"),
19 Estimated Start and Completion dates, and Total Project Cost Class.

20 **Q: Did the OUCC seek additional information regarding this project?**

21 A: Yes, additional information regarding this project was sought and obtained in

22 [REDACTED]

1 response to OUCC DR 10-46 (Confidential Attachment JTP-10).

2 **Q: Please describe the LS 511 Replacement project.**

3 A: According to the May 2018 "10 Percent Design Memorandum" prepared by Black
4 & Veatch Corporation and American Structurepoint, Inc. and supplied in response
5 to OUCC DR 10-46, [REDACTED]

6 [REDACTED]

7 [REDACTED]

8 [REDACTED]

9 [REDACTED]

10 **Q: Were any detailed cost estimates, engineering reports or other information**
11 **provided with regard to this project**

12 A: Yes. The previously mentioned, "10 Percent Design Memorandum" prepared by
13 Black & Veatch Corporation and American Structurepoint, Inc. was provided.

14 **Q: Should this project be approved?**

15 A: Yes, but not at the confidential, proposed cost of [REDACTED].

16 **Q: What should the cost for the LS 511 Replacement project be?**

17 A: Based both upon information contained in the "10 Percent Design Memorandum,"
18 and the RS Means Manual costs, adjusted in the same manner as for LS 516 for the
19 lower Indianapolis area costs, added inflation, and a 10% construction contingency
20 (instead of the CWA assumed [REDACTED] contingency), construction costs should be
21 [REDACTED]. Adding [REDACTED] for non-construction costs makes the total project cost of
22 the LS 516 project [REDACTED].²³ I recommend the difference in the project cost

23 [REDACTED]
[REDACTED]

1 between CWA’s requested [REDACTED] and \$420,000 be removed from Petitioner’s
2 revenue requirement associated with its capital spending.

D. All other Lift Station Replacement Projects

3 **Q: How many other lift station replacement projects does Petitioner include in its**
4 **funding request?**

5 A: CWA included 19 other Lift Station replacement projects plus a capacity upgrade
6 at LS 101 and a LS 547 generator project.

7 **Q: Did you make any reductions to Petitioner’s capital spending request for lift**
8 **stations?**

9 A: Yes. I reduced the total project costs for the 19 other LS replacement projects by
10 20%, which I rounded down from the 27% reduction calculated for Lift Stations
11 516 and 511.²⁴ I show the project cost reductions for the projects reviewed by the
12 OUCC in Confidential Attachment JTP-11.

E. N College Ave – W South St LDSR – 92RR02609

13 **Q: Did CWA provide any detail on this project in its case-in-chief?**

14 A: No. The project was merely identified as “N College Ave – W South St LDSR” on
15 Column A of Attachment MCJ-6, with other columns showing single-line Project
16 Number, Project Description (“1234-Collection Systems”), Project Need
17 (“Collection Systems Rehabilitation”), Alternatives Considered (“Replacement In-
18 Kind”), Estimated Start and Completion dates, and Total Project Cost Class.

²⁴ The 27% reduction in total project costs for LS 516 and 511 is calculated as \$1,102,112 requested (\$593,699 and \$508,413) minus the OUCC’s \$800,000 adjusted cost (\$380,000 for LS 516 and \$420,000 for LS 511) divided by \$1,102,112 equals 27%.

1 **Q: Did the OUCC seek additional information regarding this project?**

2 A: Yes. Additional information regarding this project was sought and obtained in
3 response to OUCC DR 10-46. The three-page, confidential response [REDACTED]

4 [REDACTED]

5 [REDACTED] This

6 confidential response is provided as Confidential Attachment JTP-12.

7 **Q: Please describe the "N College Ave – W South St LDSR" project.**

8 A: This project is a large diameter sewer rehabilitation project. The information
9 included in this response appears to contemplate [REDACTED]

10 [REDACTED] But it

11 does not state what precisely needs to be rehabilitated, how that rehabilitation will
12 be accomplished, why the rehabilitation is needed, and what options were
13 investigated.

14 **Q: Were any detailed cost estimates, routing plans or other information provided
15 for this project?**

16 A: No. As noted above, the information provided was three pages in total and offered
17 no supporting cost estimates, engineering reviews or other information to enable a
18 serious review of the project.

19 **Q: Should this project be included in Petitioner's capital spending?**

20 A: No. Given the lack of information, CWA has not shown that the project is either
21 necessary or a cost-effective approach to rehabilitating [REDACTED] feet of sewer main. It
22 is unreasonable to approve a [REDACTED] project based on such limited information.
23 As such, I recommend this project not be included in CWA's capital spending
24 revenue requirement.

F. BE-AWT ControlRoom Relocation Project – 92BE02630

1 **Q: Petitioner included a project identified as “BE-AWT ControlRoom Relocation**
2 **Project – 92BE02630.” Did Petitioner provide any detail on this project in its**
3 **case-in-chief?**

4 A: No. The project was merely identified as “BE-AWT ControlRoom Relocation
5 Project” on Column A of Attachment MCJ-6, with other columns showing single-
6 line Project Number, Project Description (“1230-WW Treatment Plants”), Project
7 Need (“Plant Rehabilitation”), Alternatives Considered (“New Technology”),
8 Estimated Start and Completion dates, and Total Project Cost Class.

9 **Q: Did the OUCC seek additional information regarding this project?**

10 A: Yes. The OUCC issued discovery seeking support for this project. A response to
11 OUCC DR 10-46 was provided. *See Confidential Attachment JTP-13.*

12 **Q: Please describe the BE-AWT ControlRoom Relocation Project.**

13 A: The BE-AWT ControlRoom Relocation Project also known as project number

14 92BE02630 [REDACTED]
15 [REDACTED]
16 [REDACTED]
17 [REDACTED]
18 [REDACTED]²⁶

19 **Q: What do the existing control rooms do?**

20 A: [REDACTED]
21 [REDACTED]
22 [REDACTED]

²⁵ *See Confidential Attachment JTP-13.*

²⁶ SCADA stands for Supervisory Control and Data Acquisition.

1 [REDACTED]

2 [REDACTED]

3 [REDACTED]²⁷

4 **Q:** How many personnel staff each existing control room?

5 **A:** [REDACTED]

6 [REDACTED]

7 [REDACTED]²⁸

8 **Q:** How many personnel will staff the new [REDACTED] control room?

9 **A:** [REDACTED]²⁹

10 **Q:** How does the existing staffing level compare to the level proposed for the new
11 [REDACTED] control room?

12 **A:** [REDACTED]

13 [REDACTED]³⁰

14 **Q:** Did CWA state that the personnel in the new [REDACTED] control room would have
15 any new responsibilities?

16 **A:** Yes. [REDACTED]

17 [REDACTED]³¹

18 **Q:** [REDACTED]
19 [REDACTED]

20 **A:** [REDACTED]

21 [REDACTED]

²⁷ See Confidential Attachment JTP-13.

²⁸ *Id.*

²⁹ *Id.*

³⁰ *Id.*

³¹ *Id.*

1 [REDACTED]

2 [REDACTED]

3 **Q:** [REDACTED]

4 **A:** [REDACTED]

5 [REDACTED]

6 [REDACTED]

7 [REDACTED]

8 **Q:** Is CWA constructing / remodeling any other spaces as part of this project?

9 **A:** Yes. [REDACTED]

10 [REDACTED]

11 [REDACTED]

12 [REDACTED]

13 [REDACTED]

14 [REDACTED]

15 [REDACTED]³²

16 **Q:** What explanation did CWA provide for the need for a new control room?

17 **A:** None. CWA provided a confidential memorandum that described the proposed

18 [REDACTED] control room and gave a cost estimate. Nowhere in the confidential

19 memorandum or case-in-chief did CWA provide an explanation as to why it needs

20 a new control room or if the control room would save any operating costs.

³² *Id.*

1 Q: What explanation did CWA provide for the need for a [REDACTED]
2 [REDACTED]

3 A: No justification was provided.

4 Q: What [REDACTED] were proposed as part of the new control room
5 project?

6 A: [REDACTED]
7 [REDACTED]
8 [REDACTED]
9 [REDACTED]
10 [REDACTED]
11 [REDACTED]
12 [REDACTED]
13 [REDACTED]
14 [REDACTED]
15 [REDACTED]
16 [REDACTED]
17 [REDACTED]³³

18 Q: Do you agree that funding to resolve [REDACTED]
19 should be approved?

20 A: No [REDACTED]
21 [REDACTED]
22 [REDACTED]
23 [REDACTED]

³³ *Id.*

1 [REDACTED]
2 [REDACTED]
3 [REDACTED]
4 [REDACTED]
5 [REDACTED]

6 **Q:** Do you agree that funding for the [REDACTED] should be approved?
7 **A:** No. [REDACTED]

8 [REDACTED]³⁴ No information was provided to compare the cost of
9 [REDACTED]
10 [REDACTED] Without this information, the project cannot be evaluated
11 for prudence.

12 **Q:** Do you agree that funding for the [REDACTED] should be approved?
13 **A:** No. [REDACTED]³⁵ It would not be easily
14 damaged. If it were damaged, then components can still be operated manually until
15 it is repaired. Additionally, CWA did not provide either a breakdown of costs
16 associated with this improvement nor any information concerning what other
17 options it considered.

18 **Q:** Do the [REDACTED] have to be made as part of the new [REDACTED]
19 control room project?
20 **A:** No. CWA has stated the [REDACTED]
21 [REDACTED]
22 [REDACTED]

³⁴ *Id.*
³⁵ *Id.*

1 **Q: How much funding did CWA request for BE-AWT ControlRoom Relocation**
2 **Project?**

3 A: CWA has estimated the total costs for the BE-AWT ControlRoom Relocation
4 Project to be [REDACTED]³⁶

5 **Q: Should funding for the BE-AWT ControlRoom Relocation Project be**
6 **approved?**

7 A: No. CWA has not provided any information to evaluate the prudence or necessity
8 of the BE-AWT ControlRoom Relocation Project nor has it provided any
9 information to support the estimated costs. As such, CWA has not met its burden
10 of proof for this project. Therefore, I recommend this [REDACTED] project not be
11 included in CWA’s capital spending revenue requirement.

G. STEP (Septic Tank Elimination Program) Projects – AB92SP

12 **Q: Did CWA provide any detail on this project in its case-in-chief?**

13 A: No. The project was merely identified as “STEP (Septic Tank Elimination
14 Program) Projects” on Column A of Attachment MCJ-6, with other columns
15 showing single-line Project Number, Project Description (“1233-STEP Projects”),
16 Project Need (“Septic Tank Elimination Program”), Alternatives Considered
17 (“Convert to Collection System”), Estimated Start and Completion dates, and Total
18 Project Cost Class.

19 **Q: Did the OUCC seek additional information regarding this project?**

20 A: Yes. Additional information regarding this project was sought and limited
21 information was obtained in response to OUCC DR 10-46.

³⁶ See Petitioner’s Confidential Attachment MCJ-6 (un-redacted).

1 **Q: Please describe the STEP (Septic Tank Elimination Program) Projects –**
2 **AB92SP.**

3 A: This project is not a specific STEP project in a specific location. Rather it is a
4 budgeted but unallocated funding source for CWA’s identified STEP should
5 additional funding be necessary. In its response to OUCC DR 10-46, CWA stated
6 a report has not been completed for the Septic Tank Elimination Program (STEP)
7 Projects – AB92SP because this project is an assignable balance (AB) pending
8 allocation “should the need arise during the fiscal year.”

9 **Q: How much funding is being allocated to STEP (Septic Tank Elimination**
10 **Program) Projects – AB92SP?**

11 A: CWA requested [REDACTED] for AB92SP.³⁷

12 **Q: Has CWA requested funding for any specific STEP projects?**

13 A: Yes. CWA seeks funds for ten STEP projects where it identifies project locations.

14 **Q: How does the funding requested for STEP (Septic Tank Elimination Program)**
15 **Projects compare to the funding requested for the specific STEP projects?**

16 A: The funding request for STEP (Septic Tank Elimination Program) Projects is higher
17 than the funding requested for six (6) of the specific STEP projects.

18 **Q: Did CWA explain why STEP project funding was needed outside of the**
19 **specific projects?**

20 A: No. While CWA did state the funding was in case the need arose, CWA did not
21 provide any information to document why it was necessary.

22 **Q: Did CWA provide an explanation of how the total project cost for STEP**
23 **(Septic Tank Elimination Program) Projects was determined?**

24 A: No. The OUCC asked CWA in DR10-46 to provide this explanation and other
25 information pursuant to Paragraph 21 of Stipulation and Settlement Agreement in

³⁷ *Id.*

1 Cause No. 44685 as follows:

2 Pursuant to Paragraph 21 of Stipulation and Settlement Agreement
3 in Cause No. 44685, please provide the "(g) estimated total project
4 cost (including soft costs), which will be provided confidentially;
5 (h) amount of project cost included in revenue requirement; (i) a
6 brief explanation of how the estimated total project cost was
7 determined; and (j) an identification of the most recently
8 completed engineering report or study related to the need for a
9 specific project that will be provided as outlined below, to the
10 extent such a report or study was developed for the particular
11 project" for each of the following projects:

12 However, the requested information was not provided in CWA's response to
13 OUCC DR 10-46.

14 **Q: Should this project be approved?**

15 A: No. CWA did not provide an adequate explanation of project need. Petitioner
16 stated it does not have an associated engineering report because STEP (Septic Tank
17 Elimination Program) Projects is an AB, assignable balance to account for pending
18 spend throughout the fiscal year should need arise.³⁸ CWA has not adequately
19 supported the project need. Therefore, I recommend this [REDACTED] contingency
20 funding project not be included in CWA's capital spending revenue requirement.

H. Wastewater Fleet Purchases and Replacements – 92FL03341 and AB92FL

21 **Q: Did CWA provide any detail for these projects in its case-in-chief?**

22 A: No. The projects were merely identified as "2019 WW Fleet Purchases" and
23 "Wastewater Fleet Replacement" on Column A of Attachment MCJ-6, with other
24 columns showing single-line Project Number, Project Description ("1246-WW

³⁸ Petitioner's supplemental response to OUCC Data Request 10-46 and Petitioner's response to OUCC Data Request 12-6 (See Attachment JTP-1).

1 Fleet & Facilities”), Project Need (“Misc”), Alternatives Considered (“New
2 Technology”), Estimated Start and Completion dates, and Total Project Cost Class.

3 **Q: Did the OUCC seek additional information regarding this project?**

4 A: Yes, additional information regarding this project was sought and obtained in
5 response to OUCC DR 10-46.

6 **Q: Please give a brief explanation of project number 92FL03341.**

7 A: Based on the project name “2019 WW Fleet Purchases – 92FL03341,” consists of
8 funds allocated to purchase new wastewater fleet vehicles in 2019.

9 **Q: Please give a brief explanation of project number AB92FL.**

10 A: “Wastewater Fleet Replacement,” project number AB92FL consists of funds
11 allocated to purchase replacement wastewater fleet vehicles in future years.

12 **Q: How much funding is being requested for 2019 WW Fleet Purchases -**
13 **92FL03341?**

14 A: CWA has estimated the costs for 2019 WW Fleet Purchases to be [REDACTED].³⁹

15 **Q: How much funding is being allocated to Wastewater Fleet Replacement -**
16 **AB92FL?**

17 A: CWA has estimated the costs for Wastewater Fleet Replacement to be
18 [REDACTED].⁴⁰

19 **Q: Why does CWA need this funding?**

20 A: The funding need is unknown. The project need was listed as “Misc” in Attachment
21 MCJ-6 of Mark C. Jacob’s direct testimony for each project. No other information
22 was provided.

³⁹ See Petitioner’s Confidential Attachment MCJ-6 (un-redacted).

⁴⁰ *Id.*

1 **Q: Did CWA provide an explanation of how the total project costs for 2019 WW**
2 **Fleet Purchases project were determined?**

3 A: No. The OUCC asked CWA in DR10-46 to provide this explanation and other
4 information pursuant to Paragraph 21 of Stipulation and Settlement Agreement in
5 Cause No. 44685 as follows:

6 Pursuant to Paragraph 21 of Stipulation and Settlement Agreement
7 in Cause No. 44685, please provide the “(g) estimated total project
8 cost (including soft costs), which will be provided confidentially;
9 (h) amount of project cost included in revenue requirement; (i) a
10 brief explanation of how the estimated total project cost was
11 determined; and (j) an identification of the most recently
12 completed engineering report or study related to the need for a
13 specific project that will be provided as outlined below, to the
14 extent such a report or study was developed for the particular
15 project” for each of the following projects:

16 However, the requested information was not provided in CWA’s response to
17 OUCC DR 10-46.

18 **Q: Did CWA provide an explanation of how the total project costs for Wastewater**
19 **Fleet Replacement projects were determined?**

20 A: Yes. In CWA’s supplemental response to OUCC DR 10-46, CWA stated the cost
21 estimate was based on “historical fleet replacement costs”.

22 **Q: Has CWA made fleet purchases in years past?**

23 A: Yes. The table below summarizes information from CWA’s IURC annual reports:

Table 5 – Historical Fleet Purchases

| Amount Spent on Fleet Purchases by Year | | | | | |
|---|-----------|-------------|-------------|-----------|-----------|
| 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
| \$687,380 | \$384,436 | \$1,006,211 | \$1,286,765 | \$811,068 | \$321,610 |

1 **Q: Based on this data what is the average amount CWA spent on fleet purchases**
2 **per year?**

3 A: CWA spent an average of \$749,578 per year on fleet replacement.

4 **Q: For what period of time is CWA requesting capital funding?**

5 A: CWA stated in Mr. Jacobs direct testimony that it is requesting funding for capital
6 projects from August 2019 to July 2022.

7 **Q: How does the amount CWA is requesting for 2019 WW Fleet Purchases**
8 **project compare to what CWA has spent in past years?**

9 A: CWA is requesting approximately [REDACTED] more for 2019 WW Fleet Purchases
10 than it spent in any given year from 2013 to 2017.

11 **Q: How do the amounts CWA is requesting for Wastewater Fleet Replacement**
12 **projects compare to what CWA has actually spent in past years?**

13 A: CWA is requesting almost the same amount for the Wastewater Fleet Replacement
14 projects as it spent in total from 2012 to 2017. This capital funding request is for
15 projects from August 2019 to July 2022. CWA has requested separate funding for
16 2019 fleet purchases. Therefore, the Wastewater Fleet Replacement project
17 funding request covers part of the same period of time that the 2019 WW Fleet
18 Purchases request covers. Including the amount requested for the 2019 WW Fleet
19 Purchases project, CWA is requesting more than two times the amount of funding
20 it has historically spent on fleet purchases.

21 **Q: Should these Vehicle Fleet replacement projects be approved at the level**
22 **requested?**

23 A: No. Instead of approving two separate line items, I recommend one line item for
24 fleet replacement from August 2019 to July 2022 be approved for \$2,248,735. This
25 amount was calculated based on the historical average of \$749,578 per year. I
26 recommend that the [REDACTED] from 2019 WW Fleet Purchases project and

1 [REDACTED] from the Wastewater Fleet Replacement project not be included in
2 CWA's capital spending revenue requirement.

I. Belmont AWT Filter Valves Replacement – 92BE02095

3 **Q: Did CWA provide any detail on this project in its case-in-chief?**

4 A: No. The project was only identified as "Belmont AWT Filter Valves Replmnt"
5 under Column A of Attachment MCJ-6, with other columns showing single-line
6 Project Number, Project Description ("1230-WW Treatment Plants"), Project Need
7 ("Plant Rehabilitation"), Alternatives Considered ("Replacement In-Kind"),
8 Estimated Start and Completion dates, and Total Project Cost Class.

9 **Q: Did the OUCC seek additional information regarding this project?**

10 A: Yes. However, no detailed information was provided such as a Needs Statement,
11 engineering planning report, or detailed cost estimates. Petitioner did provide a
12 brief project description in response to OUCC DR 12-6. *See* Attachment JTP-1.

13 **Q: Please give a brief explanation of project number 92BE02095.**

14 A: This project (and a companion project at the Southport WWTP) will replace twelve
15 20-inch flow control valves, twelve 42-inch influent valves and twelve 42-inch
16 backwash common valves and corresponding actuators which CWA indicates are
17 at the end of their useful lives.⁴¹

18 **Q: What is your recommendation regarding the Belmont AWT Filter Valves
19 replacement project?**

20 A: I recommend that the [REDACTED]⁴² funding request for the Belmont AWT Filter
21 Valves Replacement – 92BE02095 project not be included in CWA's capital

⁴¹ Petitioner's response to OUCC Data Request 12-6 (*See* Attachment JTP-1).

⁴² *See* Petitioner's Confidential Attachment MCJ-6 (un-redacted).

1 spending revenue requirement on the basis that Petitioner has not provided the
2 requested project information to support its [REDACTED] funding request over the
3 2018-2021 period.

J. SP-AWT Replace RSPS Valves – 92SO02062

4 **Q: Did CWA provide any detail on this project in its case-in-chief?**

5 A: No. The project was only identified as "SP-AWT Replace RSPS Valves" under
6 Column A of Attachment MCJ-6, with other columns showing single-line Project
7 Number, Project Description ("1230-WW Treatment Plants"), Project Need ("Plant
8 Rehabilitation"), Alternatives Considered ("Replacement In-Kind"), Estimated
9 Start and Completion dates, and Total Project Cost Class.

10 **Q: Did the OUCC seek additional information regarding this project?**

11 A: Yes. Petitioner provided an Engineering Planning Report by an outside engineering
12 consultant but did not provide a finished detailed cost estimate for the [REDACTED]
13 estimated total project cost.⁴³ See Confidential Attachment JTP-14. Petitioner did
14 provide a brief project description in response to OUCC DR 12-6. See Attachment
15 JTP-1.

16 **Q: Please give a brief explanation of project number 92SO02062.**

17 A: According to Petitioner's response to OUCC DR 12-6, this project will "replace
18 suction, discharge and check valves on four raw sewage pumps with new ones and
19 electric actuators. Also replace the isolation gates on the four wet wells." CWA
20 indicates this project will eliminate leaking at the Southport AWT Plant raw sewage

⁴³ *Id.*

1 pump station.

2 **Q: What is your recommendation regarding the SP AWT Replace RSPS Valves**
3 **project?**

4 A: I recommend that the [REDACTED] funding request for the SP-AWT Replace RSPS
5 Valves – 92SO02062 project not be included in CWA's capital spending revenue
6 requirement on the basis that Petitioner has not provided adequate support for its
7 requested [REDACTED] funding request.

K. Sludge Line Replacement – 92MW00357

8 **Q: Did CWA provide any detail on this project in its case-in-chief?**

9 A: No. The project was only identified as "Sludge Line Replacement" under Column
10 A of Attachment MCJ-6, with other columns showing single-line Project Number,
11 Project Description ("1230-WW Treatment Plants"), Project Need ("Plant
12 Rehabilitation"), Alternatives Considered ("Replacement In-Kind"), Estimated
13 Start and Completion dates, and Total Project Cost Class.

14 **Q: Did the OUCC seek additional information regarding this project?**

15 A: Yes. Petitioner provided a confidential engineering report prepared by an outside
16 consultant in 2013 that estimated project costs at [REDACTED]

17 [REDACTED]

18 [REDACTED]⁴⁴ I have not included this
19 confidential report due to the document's large size. Petitioner did provide a brief
20 project description in response to OUCC DR 12-6. See Attachment JTP-1. The

⁴⁴ Petitioner's confidential response to OUCC DR 10-46.

1 costs for each of the [REDACTED] of the sludge line, which are set forth below,
2 include a 25% construction contingency and 16% non-construction costs.

3 **Table 6 – Sludge Line Replacement – Phased Construction**

| Phase Description | 2013 Estimated Amount |
|-------------------|-----------------------|
| [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] |

4 **Q: Has Petitioner completed any of the Phases for the new sludge force mains?**

5 A: Yes. In its 2016 IURC Annual Report, Petitioner indicated it spent \$7.2 million to
6 construct Phases 1 and 4 of the new sludge lines. CWA's 2016 IURC Annual
7 Report (page S-3(c)-5), In addition, Phase 3 was previously installed in 2000 as
8 part of the Harding Street road widening project and was primarily funded by the
9 Federal Highway Administration for \$800,000. There should be no need to replace
10 this existing section of sludge pipeline because it is less than 20 years old.

11 **Q: Please give a brief explanation of project number 92MW00357.**

12 A: According to Petitioner's response to OUCC DR 12-6, this project will "use phased
13 approach to replace existing twin ductile iron sludge force mains with HDPE pipe
14 to prevent pipe failures which causes sludge holding issues at Southport AWT
15 Plant."

16 **Q: What is your recommendation regarding the Sludge Line Replacement –
17 92MW00357 project?**

18 A: I recommend that [REDACTED] of the [REDACTED] funding request for the Sludge
19 Line Replacement – 92MW00357 project not be included in CWA's capital

1 spending revenue requirement because Petitioner has already completed Phases 1,
2 3, and 4 and has not provided justification for its [REDACTED] funding request over
3 the 2013 to 2026 period. This project appears to be retroactive ratemaking for its
4 attempt to secure funding from future rate increases for projects already completed.

IV. SEPTIC TANK ELIMINATION PROGRAM CHANGES

5 **Q: What is the Septic Tank Elimination Program or ("STEP")?**

6 A: The Septic Tank Elimination Program ("STEP") began when the Sewer Utility was
7 owned by the City of Indianapolis. The STEP Program was implemented to extend
8 City Sewer service to property owners with failing private on-site wastewater
9 disposal systems (septic systems) and eliminate potential and actual public health
10 issues associated with failing septic systems. In Cause No. 43936, the Commission
11 authorized CWA, which was acquiring the City's Sewer system, to continue to
12 implement the City's STEP program and complete certain STEP projects.
13 Subsequently, in Cause No. 44305 and Cause No. 44685, the Commission
14 approved settlement agreements that provided for the continued funding of the
15 STEP program. *See* Appendix C for further STEP background information.

16 **Q: What funding has CWA requested for STEP in this Cause?**

17 A: CWA proposes to decrease its spending from the \$12 M per year (for 800 homes
18 annually) approved in the prior rate case to approximately \$6.3 M (for 300 homes
19 annually) over the next three years (\$18,980,842 total). This decrease in spending
20 is due to the 500 home reduction in the number of homes to be connected annually
21 to CWA's system and a reduced cost per home of the STEP projects. Mr. Jacob

1 also indicated CWA chose to reduce its STEP spending because CWA's projected
2 Consent Decree spending during the life of these prospective rates will be at their
3 highest level.⁴⁵

4 **Q: Of the original 18,000 priority homes on septic systems, how many have**
5 **actually connected to CWA's sewer system?**

6 **A:** In response to discovery, CWA provided the following STEP connections by
7 calendar year and the amount spent by fiscal year.⁴⁶

**Table 7 – Connections to the CWA Sewer System by Year and Costs by
Fiscal Year under CWA's Septic Tank Elimination Program**

| Year | STEP Home Connections | Fiscal Year (to Sept. 30th) | Fiscal Year Amount |
|-------------|----------------------------------|--|-------------------------------|
| 2011 | 1,187 | 2011 | \$ 30,011,356 |
| 2012 | 922 | 2012 | \$ 63,791,794 |
| 2013 | 3,312 | 2013 | \$ 31,357,716 |
| 2014 | 149 | 2014 | \$ 6,821,802 |
| 2015 | 640 | 2015 | \$ 14,203,700 |
| 2016 | 609 | 2016 | \$ 10,916,070 |
| 2017 | 356 | 2017 | \$ 12,400,362 |
| 2018 | 32 | 2018 | \$ 1,314,403 |
| Total | 7,207 | | \$ 170,817,203 |

8 Mr. Jacob testified that "through 2017, approximately 13,500 homes have been
9 provided sewers to connect to CWA's public sewer system."⁴⁷

⁴⁵ Direct Testimony of Mark C. Jacob, page 16, lines 7-13.

⁴⁶ Petitioner's responses to OUCC Data Requests 11-6 and 11-7. See Attachment JTP-2.

⁴⁷ Direct Testimony of Mark C. Jacob, page 18, lines 11-12.

1 **Q: Does this mean 13,500 homes have connected as a result of the STEP program?**

2 A: No. Mr. Jacob also testified that historically only 50% of homeowners connected
3 to the new sewers and that the low connection rate was a reason CWA recently
4 changed STEP.⁴⁸ Based on a 50% connection rate prior to 2017 and adding in the
5 32 homes that connected in 2018, I estimate only 6,800 homes may have actually
6 connected to CWA's sewer system through the end of 2018.⁴⁹ This means that of
7 18,000 priority homes, 11,200 may remain on private septic tanks posing a
8 continued threat to stream water quality and CWA's ability to meet the meet
9 applicable in-stream water quality standards.

10 **Q: Do CWA's annual STEP reports to the Commission document the numbers of**
11 **homes that actually connected each year?**

12 A: No. CWA's reports are not consistent and appear incomplete. Based on my review
13 of the STEP compliance filings, CWA completed 15 of the original 33 listed STEP
14 projects from 2014 and one new STEP project added in 2016.⁵⁰ CWA reports these
15 projects serve 1,736 homes but does not report how many homes actually
16 connected. *See* Attachment JTP-3 for CWA's Updates for its STEP projects.

17 **Q: What do you recommend regarding CWA's reporting of its STEP projects?**

18 A: Number of septic tanks actually removed should be a key performance metric that
19 CWA tracks and reports to the Commission. CWA should document and report
20 how many of the 18,000 priority homes are no longer on septic tanks. I recommend
21 that the Commission order CWA to file within 90 days of the Final Order issued in

⁴⁸ *Id.*, line 17.

⁴⁹ Calculated at 13,500 homes that were provided sewers through 2017 times 50% equals 6,750 homes plus 32 additional connection sin 2018 rounded up to 6,800 connections.

⁵⁰ CWA listed 33 STEP projects in 2014 and 2015. In 2016, five of the original STEP projects (from 2014) were dropped and 27 new STEP projects were added to the list.

1 this Cause a report documenting the performance of each completed STEP project
2 for the 18,000 priority homes including: 1) how many homes could be served by
3 each Step project; 2) how many homeowners actually connected; 3) how many
4 septic systems have been permanently closed; 4) the total amount CWA invested
5 in each STEP project; and 5) the cumulative amount invested for all STEP projects.
6 Also, I recommend the Commission direct CWA to document on a going forward
7 basis actual septic tanks removed for both previously completed STEP projects and
8 its remaining STEP projects.

9 **Q: What do you recommend regarding removal of remaining septic tanks in**
10 **previously completed STEP areas?**

11 A: STEP projects are only successful in their stated goal to prevent water
12 contamination of area streams if septic tanks are actually removed and homes are
13 connected to the sewer system. CWA should address the poor connection rates of
14 prior STEP projects that averaged only 50%. CWA should coordinate with the
15 Marion County Health Department to investigate ways it can better achieve STEP's
16 stated goal and identify additional costs needed to meet that goal. CWA should
17 report to the Commission and the OUCC the results of its completed investigation.

18 **Q: Has CWA made any changes to the way it implements the Septic Tank**
19 **Elimination Program?**

20 A: In 2017 or 2018, CWA stopped constructing conventional gravity sewers under
21 STEP. CWA indicated it plans to install only low pressure sewer systems ("LPSS")
22 for the remainder of the high priority program outlined in the STEP White Paper.⁵¹

⁵¹ Petitioner's response to OUCC Data Request 10-16. See Attachment JTP-4.

1 **Q: Why is CWA no longer constructing conventional gravity sewers for its STEP**
2 **projects?**

3 A: CWA explained the value engineering analysis it conducted showed much lower
4 costs and less disruption if it switched to installing low pressure sewer systems
5 requiring the installation of a grinder pumps at each house. Petitioner's witness
6 Mr. Jacob reported average costs for a gravity sewer STEP project was \$31,700 per
7 home (2005 through 2016) with the homeowner paying \$6,766 for the connection
8 and permit fee (\$2,766), plumbing changes and installing the house lateral to
9 connect to the gravity sewer and removing the septic tank (\$4,000).⁵² CWA
10 reported its cost of installing a low pressure sewer system is \$18,700, a 40%
11 reduction, or \$13,000 from the \$31,700.

12 **Q: What LPSS construction costs are now the homeowners' responsibility?**

13 A: For construction, homeowners no longer have to pay anything. CWA pays all costs
14 to install the small diameter low pressure sewers (typically 2-inch to 3-inch
15 diameter HPDE main line pipe). CWA contractors also install the grinder pumps
16 at each house, make the electrical connections to each homeowner's electrical
17 service, re-plumb and connect the homeowner's sewage drain pipes to the grinder
18 sumps, close each septic tank, and restore each property.

19 **Q: What are the annual costs to homeowners for grinder pumps?**

20 A: Homeowners must pay to power the pump through their electrical service and are
21 responsible for annual grinder pump maintenance, all emergency repairs, and their

⁵² Direct Testimony of Mark C, Jacob, page 36. Note there are price discrepancies in CWA's testimony regarding homeowner costs for connecting to the gravity sewers.

1 monthly sewer bill. CWA stated that the annual power cost is \$12 and the annual
2 maintenance cost is \$50 based on the manufacturer's information.⁵³

3 **Q: What are the long term costs to homeowners for grinder pumps?**

4 A: While CWA buys the initial grinder pump using its leveraged purchasing power,
5 homeowners are responsible for replacing the pump when the pump no longer
6 functions properly.⁵⁴

7 **Q: How much does a new grinder pump cost?**

8 A: According to information CWA publishes on its website, the new pump cost is
9 \$2,500.⁵⁵ On the same site, typical service life of the grinder pump is reported to
10 be 20 years.

11 **Q: Did Petitioner provide a value engineering study to justify changing from**
12 **conventional gravity sewers to a low pressure system?**

13 A: No. Petitioner did not provide a value engineering study comparing the capital and
14 operating costs of gravity and low pressure systems. In response to discovery,
15 Petitioner provided a Septic Tank Elimination Program Whitepaper prepared by
16 Citizens' Underground Engineering & Construction group, but that was not a value
17 engineering study. See Attachment JTP-4. CWA's STEP Whitepaper only looks
18 at CWA's capital costs. It does not include operating, maintenance, and grinder
19 pump replacement costs which are all the responsibility of the homeowners.

⁵³ See Attachment JTP-2 for Petitioner's responses to OUCC Data Requests regarding STEP. CWA's website providing information on STEP indicates that power costs would be \$15 to \$20 per year. See Attachment JTP-5.

⁵⁴ Grinder pumps are warranted for three years from the date of installation.

⁵⁵ See Attachment JTP-5 for CWA website information for STEP which states: "If properly maintained, the average life of a grinder pump is 20 years. Each pump comes with a standard two-year parts and labor warranty. On average, the cost to replace a grinder pump is around \$2,500."

1 **Q: Are low pressure sewer systems with grinder pumps less costly than**
2 **conventional gravity sewers?**

3 A: Yes. Based on CWA's reported costs that the homeowner's annual operating
4 (power) and maintenance cost would be \$62, an annual allowance of \$50 for
5 mainline maintenance, and an assumed \$3,000 grinder pump replacement cost
6 (present value), the present value of the low pressure system per single connection
7 is \$23,500.^{56 57} This is substantially below CWA's reported \$31,766 cost per home
8 for conventional gravity sewers. Savings are reduced from Petitioner's reported
9 \$13,000 but are still substantial at \$8,266 per home. For my present value
10 calculations, I looked at only a 20 year period. Over a 60 to 100 year period, equal
11 to the expected life of gravity sewers, the present value cost savings would shrink
12 because of continued O&M costs and periodic grinder pump replacements (every
13 20 years). In addition, the \$50 per year grinder pump maintenance cost used by
14 CWA is based on a more expensive E/One 2000 Series grinder pump and not the
15 Extreme Series grinder pump that CWA is actually installing.⁵⁸

16 **Q: From the perspective of a CWA customer, are low pressure sewer systems with**
17 **grinder pumps less costly than conventional gravity sewers?**

18 A: No. In addition to paying for wastewater services at the same rates as CWA's other
19 customers, homeowners with grinder pumps will pay added electricity costs to

⁵⁶ Calculated as \$18,766 cost to construct and connect plus the present value of \$62 per year for power and grinder pump maintenance and \$50 per year for mainline maintenance (\$1,746 present value based on 20 years at 2.5% interest rate) plus an assumed \$3,000 present value for grinder pump replacement equals \$23,500 (rounded).

⁵⁷ There appears to be some discrepancy about grinder pump replacement costs. CWA reports the cost at \$2,500 on its website, but the confidential grinder pump cost information provided in response to OUCC Data Request 10-27 shows the current cost for the E/One Extreme series pumps range from [REDACTED] (for standard and in-home installations) to [REDACTED] (for Floodway installations). These are costs to CWA and do not reflect the price an individual homeowner would pay for emergency replacement of a grinder pump.

⁵⁸ Per Don Mink communication. See the Customer comments in Public Exhibit No. 7.

1 power the pumps and need to budget for grinder pump maintenance and
2 replacement. During pump malfunctions, homeowners will have to contract with a
3 plumber and/or a pump repair company to troubleshoot and repair or replace the
4 pump. If the grinder pump is not repairable, homeowners will have to replace the
5 pump at their cost. While CWA can leverage its buying power to obtain lower
6 pump costs for initial installation, individual homeowners do not have this same
7 buying power and can expect to pay substantially more to remove the old pump and
8 purchase and install a replacement grinder pump, especially under unplanned
9 outages.

10 **Q: What problems arise with grinder pump breakdowns?**

11 A: Unlike gravity sewers which have no electrical or mechanical systems that fail
12 (ignoring lift stations), if the grinder pump breaks down or power is lost, the
13 homeowners can no longer discharge sewage as normal and must curtail toilet use,
14 showering, dishwashing, and clothes washing until the grinder pump is repaired or
15 replaced or risk raw sewage overflows onto their property. Homeowners would
16 have to locate a repair service and schedule and pay for emergency repairs or
17 replacement. Rebuild or replacement costs would be high for homeowners who
18 would be limited to the original pump supplier. The danger from pump breakdowns
19 is prolonged sewer outages and the possibility that raw sewage would overflow the
20 grinder pump sump onto homeowners' properties which could then reach area
21 streams. Many homeowners may be unable to pay for an unexpected and unplanned
22 high bill to rehabilitate or replace their grinder pumps.

1 **Q: How do other utilities handle emergency repairs and grinder pump**
2 **replacements?**

3 A: My research shows other utilities retain operational and financial responsibility for
4 emergency breakdowns and replacements of the grinder pumps instead of
5 homeowners.⁵⁹ When a grinder pump alarm activates, homeowners call their sewer
6 utility who respond with maintenance personnel to troubleshoot the pump problem
7 and restore sewer service. These utilities also rehabilitate and replace the grinder
8 pumps at the utility's cost which is recovered through sewer rates. They have
9 experienced and properly trained staff with the tools and equipment to quickly
10 assess the pump problem and restore service. *See* Attachment JTP-6 for emergency
11 repairs and replacement information for Grinder Pump systems at other Utilities.

12 **Q: What is your recommendation regarding the grinder pumps?**

13 A: I do not oppose CWA's decision to install low pressure sewer systems with grinder
14 pumps, but I believe gravity sewers remain the most reliable long term option for
15 sewage disposal. If CWA's value engineering studies indicate lower installation
16 and maintenance costs without degradation of quality service, it would make sense
17 for CWA to install low pressure systems instead of gravity sewers. However, part
18 of the cost CWA should consider in its value engineering analysis are not really
19 borne by CWA. CWA customers who receive low pressure systems bear part of
20 the cost, and this is not a cost other CWA customers, who have received access to
21 more costly gravity sewers, have to bear.

⁵⁹ *See* Attachment JTP-6 for grinder pump repairs and replacement policies for Athens, TN, Brentwood, TN, First Utility District in Knox Co., TN, Leesburg, IN, and Kitsap Co., WA.

1 If the Commission approves CWA's switch to only installing low pressure
2 systems with grinder pumps, I recommend the Commission order CWA to be
3 responsible for emergency repairs, pump maintenance and pump replacement.
4 Homeowners would still be responsible for the extra electrical cost to operate the
5 pumps and would pay the same wastewater rates for sewer service as CWA's other
6 customers are paying to construct the high costs CSO control measures. Based on
7 CWA's plan to replace 300 additional priority homes on septic tanks each year (and
8 3,000 homes in total by the end of 2025) with low pressure systems, I recommend
9 CWA's annual revenue requirement be increased by \$50 per year for annual grinder
10 pump maintenance per home or \$15,000 for 2019, \$30,000 for 2020, and \$45,000
11 for 2021.

V. OPEN COMPETITIVE BIDDING

12 **Q: Prior to the acquisition by CWA Authority, did the Indianapolis Department**
13 **of Public Works follow the public bidding laws for its capital projects?**
14 **A:** Yes. As a municipality, the Indianapolis Department of Public Works ("DPW")
15 was required to bid its projects valued at over \$150,000 in an open competitive
16 bidding process defined by IC § 4-13.6-5-1 et al. This procurement process, known
17 as a Design-Bid-Build ("DBB") process included preparation of plans and
18 specifications by a professional engineer to define the work for which the City was

1 seeking contractor bids. These design documents form the basis for Record
2 Drawings after project completion.

3 The project bidding documents also detailed provisions such as
4 disadvantaged businesses participation, buy American requirements, non-
5 collusion, insurance requirements, financial capability, performance and payment
6 bonds, subcontractor identification and contract amounts, bid proposal forms,
7 addendums to the plans and specifications, and set the date and time for submitting
8 sealed bids. The project bid documents were disseminated through various outlets
9 and mandatory advertisements for bids to inform contractors about the project. Pre-
10 bid meetings were also held in conjunction with a site visit to answer contractor
11 questions about the project and enable contractors to view site conditions. At the
12 bid opening, sealed contractor bids would be opened and read aloud into the record
13 in front of all contractors and interested parties who attended. The bids would then
14 be evaluated by the engineer and City staff for compliance with the bid documents
15 to determine the lowest responsive and responsible bidder. Bids would also be
16 compared to the Engineer's Estimate prepared before bids were received looking
17 for tight cost spreads of the bids below the Engineer's Estimate. The goal of public
18 bidding is to attract multiple contractors or equipment vendors (typically 6 to 9) to
19 foster competition.

20 Open competitive public bidding aims to obtain the lowest cost projects
21 constructed by responsive and responsible contractors in conformance with the bid
22 documents. It also seeks to avoid contractor collusion and bid rigging that would
23 raise project costs. Contractors were generally not preselected or prequalified for

1 most sewer, lift station, and treatment plant projects which would limit instead of
2 promoting competition.

3 **Q: Does Petitioner competitively bid its capital projects in the manner set forth**
4 **in the public bidding law (IC § 4-13.6-5-1 et al)?**

5 A: No. In response to OUCC discovery (OUCC DR 11-12) asking what steps CWA
6 Authority takes to follow public bidding law in Indiana (IC § 4-13.6-5) to select the
7 lowest responsive and responsible bidder to construct its capital projects, Petitioner
8 indicated it does not have to follow public bidding because it is an Indiana not-for-
9 profit corporation governed by IC 8-1-11.1 *et seq.* Petitioner explained that IC §
10 8-1-11.1-3(c) (2) provides in relevant part:

11 In connection with the duties devolving upon such board of directors
12 in the government, management, regulation, control, and operation
13 of all such utilities, it may act as follows: . . .

14 (2) To design, order, contract for, and construct any and all
15 necessary or desirable extensions of or additions to any utility plant
16 and property owned or so held in trust by the city, and to enter into
17 all necessary contracts with reference thereto, and with reference to
18 the purchase of materials and supplies needed for the operation of
19 any such plant or plants, in accordance with such rules as may be
20 adopted by such board of directors, and without the necessity of
21 advertising for bids, or without such other restrictions as are
22 imposed by any law of Indiana with reference to the letting of
23 contracts for work, material, or supplies by municipal bodies or
24 other governmental agencies.

25 (Emphasis added by Petitioner.)

26 **Q: Since CWA does not conduct open competitive public bidding under IC § 4-**
27 **13.6-5-1 et al, how does CWA Authority select contractors for its capital**
28 **projects?**

29 A: In response to discovery, CWA stated it follows a best value and competitive
30 proposal process and included a one-page example to illustrate the final selection
31 process (grinder pumps proposals evaluation). None of the vendor proposals or

1 individual scoring sheets were provided. *See* Confidential Attachment JTP-7. The
2 confidential selection criteria show the criteria CWA evaluated which included
3 [REDACTED] CWA did not discuss or provide its rationale for
4 how it determined the selection criteria to use or what weighting factor to apply to
5 each criteria. CWA stated competitive pricing was and is typically one of the
6 largest factors in the selection of the final vendor, but as can be seen by the scoring
7 results, three of the four vendors received the same score for price. Selection falls
8 to other criteria such as the supplier's description of its experience.

9 **Q: Is CWA prohibited from returning to the City's practice of engaging in open**
10 **competitive bidding for some of its projects?**

11 A: No. IC 8-1-11.1 *et seq.* does not include any provision prohibiting or preventing
12 CWA Authority from using open competitive bidding and awarding projects to the
13 lowest responsive and responsible bidders, if it chooses.

14 **Q: Did CWA provide any evidence in its case-in-chief that its best value and**
15 **competitive proposal process actually results in the lowest costs to the utility?**

16 A: No.

17 **Q: What do you recommend regarding open competitive bidding?**

18 A: CWA's ratepayers would benefit from lower project costs if CWA utilized the
19 public bidding process for at least some of its projects. I strongly believe in the
20 value of public bidding to deliver capital projects at the best value to ratepayers. It
21 was the process followed by the City for decades for its wastewater projects and is
22 required for projects funded through the Indiana Finance Authority's ("IFA") Clean
23 Water State Revolving Fund ("CWSRF") loan program and the US Department of
24 Agriculture's ("USDA") Rural Development ("RD") program.

VI. INFORMATION ABOUT CAPITAL IMPROVEMENT PROJECTS

1 **Q: Was a lack of information about proposed capital projects and their need an**
2 **issue in Petitioner's prior rate case, Cause No. 44685?**

3 A: Yes. There was a lack of information in Petitioner's case-in-chief in the last Cause.
4 This led to added time and costs to ratepayers to obtain basic project information
5 and support documentation needed to determine if the proposed projects were
6 prudent and the costs reasonable. The OUCC sought information showing that
7 Petitioner was conducting proper planning and evaluating alternatives for its capital
8 projects and not just for Consent Decree projects.

9 **Q: Did CWA agree to provide project information with its next base rate case?**

10 A: Yes. It was believed the Settlement Agreement resolved the issue of inadequate
11 information available to review projects. The Settlement Agreement stated that in
12 future rate cases, CWA agrees that for those costs that make up the capital program
13 portion of its revenue requirement, whether funded through rate revenues or debt,
14 CWA will provide the following information in its case-in-chief, in spreadsheet
15 format: (a) project name; (b) project number; (c) a brief description of the project;
16 (d) a brief explanation of the need for the project; (e) a brief description of the
17 alternatives considered, if applicable; (f) estimated project start date; (g) estimated
18 completion date; and (h) the total project cost estimate class.

19 **Q: Did CWA provide the required capital project spreadsheet?**

20 A: Yes. A two page spreadsheet listing 108 capital projects with a total cost of
21 [REDACTED] was provided as Attachment MCJ-6.

1 **Q: Did Petitioner provide satisfactory project descriptions and satisfactory**
2 **explanations of why each project is needed?**

3 A: No. The descriptions were inadequate providing no useable or reviewable
4 information about what Petitioner proposes to build. For example, Petitioner
5 described the "Bel-AWT Misc. HVAC Imprvmnt" as "1230-WW Treatment
6 Plants" and identified the project need with two words -- "Plant Rehabilitation." A
7 similar pattern exists for all 108 projects listed on MCJ-6 that are described and
8 justified with one of the seven location of category descriptors below:

| 9 | c) Project Description | d) Project Need | Projects |
|----|-------------------------------|-----------------------------------|-----------------|
| 10 | 1230- WW Treatment Plants | Plant Rehabilitation | 32 |
| 11 | 1231- Environmental | Environmental | 3 |
| 12 | 1232- Federal Consent Decree | Consent Decree | 6 |
| 13 | 1233- STEP Projects | Septic Tank Elimination Program | 11 |
| 14 | 1234- Collection Systems | Collection Systems Rehabilitation | 48 |
| 15 | 1246- WW Fleet & Facilities | Misc | 4 |
| 16 | 1247- WW Technology Projects | Misc | 4 |

17 **Q: Did Petitioner agree to provide additional project information in response to**
18 **discovery?**

19 A: Yes. CWA agreed to provide in discovery or otherwise upon request the estimated
20 total project cost (including soft costs), which will be provided confidentially; the
21 amount of project cost included in revenue requirement; a brief explanation of how
22 the estimated total project cost was determined; and an identification of the most
23 recently completed engineering report or study related to the need for a specific
24 project that will be provided as outlined in the Settlement Agreement to the extent
25 such a report or study was developed for the particular project.

26 The Settlement Agreement stated that the information to be filed by CWA
27 in its next base rate case, will enable the OUCC and other interested parties to know
28 what specific capital projects are proposed as a reasonable representation of the

1 projects to be completed and the need for each capital project. This information
2 will provide better transparency and will provide for more efficient review of the
3 proposed capital projects.

4 **Q: In its case-in-chief, did Petitioner document costs to support the amount it is**
5 **requesting for its capital projects?**

6 A: No. Petitioner's case-in-chief includes neither detailed cost estimates nor cost
7 support for any project. Petitioner simply provided lump sum project costs. I would
8 note that when utilities do not provide adequate information in their cases-in-chief,
9 the OUCC is left with no choice than to issue substantial data requests in order to
10 prepare its case.

VII. RECOMMENDATIONS

11 **Q: What are your recommendations?**

12 A: I recommend the following:

- 13 1. For STEP projects, I recommend the Commission provide that CWA retain
14 ownership of the grinder pumps it has installed and use its maintenance staff to
15 provide emergency response and repairs for the grinder pumps and ongoing
16 pump replacements when they reach the end of their service lives.
- 17 2. I recommend that \$25,514,264 of project costs be removed from Petitioner's
18 revenue requirement associated with its capital spending for eleven specific
19 capital projects discussed in my testimony as well as 19 lift station replacement
20 projects which are summarized in Attachment JTP-11.
- 21 3. I recommend the Commission order CWA to file within 90 days of the Final
22 Order issued in this Cause a report documenting the performance of each

1 completed STEP project for the 18,000 priority homes including: 1) how many
2 homes could be served by each Step project; 2) how many homeowners actually
3 connected; 3) how many septic systems have been permanently closed; 4) the
4 total amount CWA invested in each STEP project; and 5) the cumulative
5 amount invested for all STEP projects.

6 4. I recommend the Commission direct CWA to document on a going forward
7 basis actual septic tanks removed for both previously completed STEP projects
8 and its remaining STEP projects.

9 5. I recommend CWA's annual revenue requirement be increased by \$50 per year
10 for annual grinder pump maintenance per home under the STEP program or
11 \$15,000 for 2019, \$30,000 for 2020, and \$45,000 for 2021.

12 6. I recommend the Commission direct Petitioner to provide more detailed project
13 information, including information establishing the need for the project, in its
14 next rate case.

15 **Q: Does this conclude your testimony?**

16 **A: Yes.**

Appendix A

1 **Q: Please describe your educational background and experience.**

2 A: In 1980 I graduated from Purdue University, where I received a Bachelor of Science
3 degree in Civil Engineering, having specialized in Environmental Engineering. I
4 then worked with the Peace Corps for two years in Honduras as a municipal
5 engineer and as a Project Engineer on self-help rural water supply and sanitation
6 projects funded by the U.S. Agency for International Development (U.S. AID). In
7 1984 I earned a Master of Science degree in Civil Engineering and Environmental
8 Engineering from Purdue University. I have been a Registered Professional
9 Engineer in the State of Indiana since 1986. In 1984, I accepted an engineering
10 position with Purdue University, and was assigned to work as a process engineer
11 with the Indianapolis Department of Public Works ("DPW") at the City's Advanced
12 Wastewater Treatment Plants. I left Purdue and subsequently worked for
13 engineering consulting firms, first as a Project Engineer for Process Engineering
14 Group of Indianapolis and then as a Project Manager for the consulting firm HNTB
15 in Indianapolis. In 1999, I returned to DPW as a Project Engineer working on
16 planning projects, permitting, compliance monitoring, wastewater treatment plant
17 upgrades, and combined sewer overflow control projects.

18 **Q: What are the duties and responsibilities of your current position?**

19 A: My duties include evaluating the condition, operation, maintenance, expansion, and
20 replacement of water and wastewater facilities at utilities subject to Indiana Utility
21 Regulatory Commission ("Commission") jurisdiction.

22 **Q: Have you previously testified before the Commission?**

23 A: Yes.

Appendix B - List of Attachments

- Attachment JTP-1 Project Descriptions and Needs – Petitioner Response to Data Request 12-6.
- Attachment JTP-2 CWA responses to OUCC Data Requests regarding STEP
- Attachment JTP-3 Septic Tank Elimination Program (“STEP”) reports filed with the Commission per Cause No. 44305.
- Attachment JTP-4 Septic Tank Elimination Program Whitepaper prepared by Citizens’ Underground Engineering & Construction group, October 27, 2017
- Attachment JTP-5 CWA website information for STEP.
- Attachment JTP-6 Grinder Pump systems at other Utilities

Confidential Attachments

- Attachment JTP-7 Grinder pump evaluation provided in response to OUCC Data Request No. 10-27 (Confidential)
- Attachment JTP-8 Interplant Fiber Optic Comm – 92MT00357, Petitioner’s response to OUCC Data Request 10-46
- Attachment JTP-9 LS 516 Replacement – 92LS02673, Petitioner’s response to OUCC Data Request 10-46
- Attachment JTP-10 LS 511 Replacement – 92LS02675, Petitioner’s response to OUCC Data Request 10-46
- Attachment JTP-11 Summary of OUCC Reductions in Total Project Costs
- Attachment JTP-12 N College Ave – W South St LDSR – 92RR02609, Petitioner’s response to OUCC Data Request 10-46
- Attachment JTP-13 BE-AWT ControlRoom Relocation Project – 92BE02630, Petitioner’s response to OUCC Data Request 10-46
- Attachment JTP-14 SP-AWT Replace RSPS Valves – 92SO02062, Petitioner’s response to OUCC Data Request 10-46

Appendix C - Septic Tank Elimination Program Information

1 Septic tank failures in Marion County were first addressed in a systematic manner
2 through the City's 1998 Barrett Law Master Plan ("BLMP"). The City, working
3 with the Marion County Health Department, identified almost 30,000 septic tanks
4 and prioritized 18,000 un-sewered "clustered" homes for systematic replacement
5 from septic systems to connection to new gravity sewers. Under the Barrett Law,
6 homeowners paid almost all costs through property tax assessments to install new
7 sewers, connect to the new sewer, and remove their septic tanks. In 2005, due to
8 the homeowner cost burden, the City ended the Barrett Law Program, replacing it
9 with the Septic Tank Elimination Program ("STEP"). Project costs for mainline
10 sewer construction were paid through sewer user fees. Petitioner's witness Jacob
11 testified homeowners were still responsible for costs averaging \$7,000 (including a
12 \$2,766 flat fee from a \$2,530 connection fee and \$236 permit fee) to make
13 plumbing changes and install a house lateral to connect to the new mainline sewer
14 and remove their septic system.^{60 61}

15 Although STEP was not a specific Combined Sewer Overflow ("CSO")
16 control measure in the Consent Decree, the City's original Long Term Control Plan
17 ("LTCP") recognized the adverse water quality impacts from failed septic systems
18 and identified 18,000 high priority septic systems to be removed through STEP

⁶⁰ Direct Testimony of Mark C. Jacob, page 15, lines 12-13.

⁶¹ However, in Cause No. 44305 (2013) Mr. Jacob testified that the total cost to each homeowner under STEP averaged approximately \$5,000, including the connection fee. *See* Direct Testimony of Mark C. Jacob, Cause No. 44305, page 19, lines 15-16.

1 estimated to cost \$319 million (2004 dollars).⁶² When CWA acquired the
2 wastewater assets in 2011, it agreed to continue STEP. Citing public health
3 benefits, the Commission approved CWA's STEP funding of \$48 M for 2014 and
4 2015 to connect 700 to 900 homes per year in CWA's first rate case.^{63 64} In Cause
5 No. 44685, the Commission approved CWA's requested \$12 M in annual STEP
6 funding to connect 800 homes per year (out of approximately 8,400 remaining
7 priority homes), noting CWA's concern that without eliminating the pollution
8 caused by failing septic systems, CWA's financial investment in the Consent
9 Decree control measures may be insufficient to meet applicable in-stream water
10 quality standards.⁶⁵

⁶² *Id.*, pages 14-15, lines 22-23 and 1-5.

⁶³ *Id.*, page 28, lines 1-5

⁶⁴ Final Order, Cause No. 44305 (2016), page 20. The Commission also required CWA to provide the Commission with a detailed, prioritized list of its planned STEP projects and to file an annual report as long as the STEP is in place that includes any updates or changes to the STEP projects list, and a list of all STEP projects completed, including costs. *See* Attachment JTP-3 for the STEP reports.

⁶⁵ Final Order, Cause No. 44685, page 20.

| OUCC DR 12.6 | | | |
|--|----------------|---|---|
| Descriptions and Needs Corresponding to Projects in Attachment MCJ-6 | | | |
| Project Name | Project Number | a) Description of the work being proposed that explains the components of the work such as descriptions that would be part of a Needs Statement prepared by operators or engineers for submittal to Citizens management for review and approval. ¹ | b) Description of the need for each project and what each project will specifically accomplish. |
| Notes: | | | |
| 1. Quantities are approximate and vary in accuracy from planning level through various stages of design and additionally may vary based upon actual conditions encountered during construction. | | | |
| 2. An Assignable Balance is a budget line item for costs anticipated in a program but without a specific project yet identified. Once a project is identified with specific cost, the AB amount is reduced accordingly. ABs are based upon historical costs that are anticipated to occur each year. | | | |
| AWT Solids Replace Switchgear | 92BE02089 | At Belmont AWT Plant, four 4160-volt duplex switchgears have deteriorated and need replaced. | Provide reliable power and eliminate existing rusted lead coated steel housings. |
| Bel-AWT Screw Bearing Replmnt | 92BE02091 | Replace the 10 screw pump lower bearings including new concrete pedestals, steel wear plates and new lubrication pumps. | Extend the service life of the screw pump assets. |
| Bel-AWT PDPS Discharge Mod. | 92BE02092 | Reroute the PDPS force main to Junction Structure No. 1., so flow can be diverted to the primary influent or primary effluent. | Provide operational flexibility to divert flow as needed. |
| Bel-AWT Filter Valves Relpmnt | 92BE02095 | Replace 12 - 20" flow control valves, 12 - 42" influent valves, and 12 - 42" backwash common valves and corresponding actuators. | Replace existing valves and actuators that are at the end of their useful lives. |
| Bel-AWT Air Blowers Imprvmnt | 92BE02097 | Conduct a system-wide evaluation of air compressors and blowers for various processes to determine which components to replace or rehabilitate. | Replace or rehab blowers as needed (to be determined). |
| Bel-AWT Centrifuges Imprvmnt | 92BE02098 | Inspect the existing centrifuge shafts to identify performance issues after 42-45 months of daily sludge dewatering service. | Replace or rehab of centrifuges as needed (to be determined). |
| Bel-AWT Aerated Grit Imprvmnt | 92BE02099 | Install isolation gates/actuators and drain valves for the aerated grit system. | Allow operations to take tanks out of service as needed. |
| Bel-AWT Misc. HVAC Imprvmnt | 92BE02101 | Replace HVAC equipment. | Provide new HVAC equipment better suited to the current operations. |
| BE-AWT Filters Rehabilitation | 92BE02627 | Replace filter media and other components as needed. | Provider new filter media and other appurtenances. |
| BE-AWT ControlRoom Relocation | 92BE02630 | Install a centralized control room for solids handling, Belmont liquids, Southport liquids and lift station SCADA operations. | New consolidated control room to allow for a more secure environment and more efficient operations. |
| MHI Main Stack Rehabilitation | 92BE02833 | Repair masonry and refractory on the main MHI emissions stack at Belmont AWT Plant. | Repairs are needed due to standard wear and tear. Repaired stack will keep MHI in service. |
| Sludge Blending Improvements | 92BE03065 | Convert the two sludge EQ tanks to blending tanks at Belmont AWT Plant. | Convert the EQ tanks to solids blending tanks which will provide 10x more capacity to adjust sludge consistency. |
| Primary Clarifiers Rehab Ph2 | 92BE03089 | Replace the long collector and cross collector mechanisms for clarifiers 1-6 at Belmont AWT Plant. | Equipment is past the end of useful service life and prone to failure. |
| ONS Wall Tie Replacement | 92BE03109 | Construct exterior columns/buttress walls to reinforce the exterior walls of ONS facility at Belmont AWT Plant. | Eliminate need to inspect existing wall ties which requires extensive dewatering, system down time and confined space entry. |
| Feeder Relay Replacement | 92BE03115 | Replace 21 GE Multilin SR 735 feeder relays with the SR 350 relays at Belmont AWT Plant. | Existing relays are obsolete and need to be replaced with new model. |
| Cake Pump 1-4 Replacement | 92BE03167 | Replace cake pump 1-4, hydraulic units and all hydraulic feed and return lines at Belmont AWT Plant. | Systems are reaching the end of useful service life and are showing extensive wear to pump structural elements and welds. |
| PAC Replacement | 92BE03168 | Replace the existing two Process air compressors (PAC) with three new compressors at Belmont AWT Plant. | Replace the current system that is nearing the end of its useful life with new compressors and controls for cycling and redundancy. |
| Centrate Monitoring System | 92BE03295 | Install instrumentation to monitor centrate solids capture at Belmont AWT Plant. | Help operations controls and optimize the polymer dosage. |
| LS 505 Generator | 92LS03156 | Replace obsolete diesel generator with new natural gas generator for lift station. | Eliminate on-site fuel storage and install permanent backup power generator for lift station. |
| GBT HVAC Controls Upgrade | 92MF02901 | Install new control system for the GBT HVAC components at the AWT plants. | Replace existing component with ones compatible for the Rockwell Control System which is standard throughout the AWT. |
| Interplant Fiber Optic Comm | 92MT01601 | Install new fiber optic line with 1 Gbps transfer speed to allow remote communication and process control at Belmont and Southport AWTs. | Provide additional speed and bandwidth compatible with Rockwell Control System at the plants and for DRTC PS. |
| Sludge Line Replacement | 92MW00357 | Use phased-approach to replace existing twin ductile iron sludge force mains with HDPE pipe. | Prevent pipe failures which causes sludge holding issue at Southport AWT Plant. |

| OUCC DR 12.6 | | | |
|--|-----------------------|--|--|
| Descriptions and Needs Corresponding to Projects in Attachment MCJ-6 | | | |
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| Notes: | | | |
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| AWT Solids Mgmt Improvements | 92MW02632 | Evaluate sludge processing options with potential energy recovery options including digester construction for Southport AWT Plant. | Construct facilities to improve Belmont and Southport sludge processing. |
| Sp-AWT Facilities Rehab Ph-2 | 92SO02060 | Install new asphalt roads, add new containment curb and protective coating at Grease & Scum building, remove two obsolete structures, replace window, door and roofs as well as repair masonry/concrete at specific above ground buildings. | Complete demolition of existing structures that are no longer used and rehab existing buildings and roadways at Southport AWT Plant. |
| Sp-AWT Replace RSPS Valves | 92SO02062 | Replace suction, discharge and check valves on four raw sewage pumps with new ones and electric actuators. Also, replace the isolation gates on the four wet wells. | Eliminate leaking at the Southport AWT Plant raw sewage pump station. |
| SP-AWT Potable Water Upgrade | 92SO02094 | Evaluate options to upgrade the potable water system including possibly extending water service from the west to the to central and east parts of Southport campus. | Eliminate deficiencies in Southport AWT Plant's potable water system found during the recent expansion project to improve supply and operations. |
| SP-AWT Filter Valves Relpmnt | 92SO02096 | Replace 12 - 20" flow control valves, 12 - 42" influent valves, and 12 - 42" backwash common valves and corresponding actuators. | Replace existing valves and actuators that are at the end of their useful lives. |
| STS Valve Replacement | 92SO03336 | Replace the valves and actuators within the pig launch structure. Also, modify the sludge piping to increase flexibility with the sludge transfer pumps. | Replace leaking and difficult to operate valves in the pig launch. Add actuators to critical valves for operational control. |
| EnergyEfficientOptimize | 92SY01492 | Incorporate the existing meters into the AWT central SCADA to monitor usage. | Identify ways to reduce energy consumption and to operate the major equipment in more efficiently. |
| Belmont AWT UV Bulbs and Ballast Replacement | AB92BB | Purchase 2,688 UV bulbs to replace during non-disinfection season between November to March. | Replace UV bulbs and ballasts to ensure the UV disinfection performance for permit compliance. |
| AWT Plant MCI | AB92MF | Based on historical needs, anticipated work for the wastewater processes (i.e., pumps, valves, blowers, etc.). | Provide equipment and/or construction needed for operating the wastewater plants. |
| Energy Electrical Upgrades | AB92MP | Based on historical needs, anticipated work to replace equipment due to end of useful service life. | Maintain service. |
| Continuous River Monitoring | AB92CR | Based on historical needs, anticipated work to repair/replace in-situ monitoring devices used for parameters like pH, dissolved oxygen, and conductivity and report near real time river water quality data. | Maintain ability to monitor river quality by replacing equipment as needed. |
| LRF - Misc. Environmental Capital Expenditures | AB92EN | Based on historical needs, anticipated work related to environmental testing, planning, and enforcement. | Ensure that necessary funds are available for unforeseen and new issues. |
| Lab Equip Replacement-CWA | AB92LR | Based on historical needs, anticipated work for the laboratory including replacing equipment. | Ensure that necessary laboratory equipment is available for daily testing needs. |
| Upper Pogues Run | 92IN00129 | Construct a two million gallon below ground CSO storage tank located in Brookside Park including mechanical, electrical, and plumbing systems for dewatering capabilities along with near surface consolidation sewers, diversion structures, regulator structures, and a screen and gate structure. | Comply with a Federal Consent Decree. |
| CSO 033 Separation | 92ST00232 | Sanitary sewer separation utilizing green infrastructure, including road-side planters that act as bioretention for storm water. | Comply with a Federal Consent Decree. |
| Lower Pogues Run Tunnel | 92TU00125 | Construct approximately 10,200 linear feet of deep rock CSO storage tunnel with a finished diameter of 18-feet including drop shafts, near surface consolidation sewers, and associated infrastructure. | Comply with a Federal Consent Decree. |
| White River Tunnel System | 92TU00126 | Construct approximately 30,600 linear feet of deep rock CSO storage tunnel with a finished diameter of 18-feet including drop shafts, near surface consolidation sewers, and associated infrastructure. | Comply with a Federal Consent Decree. |

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| Fall Creek Tunnel System | 92TU00128 | Construct approximately 18,000 linear feet of deep rock CSO storage tunnel with a finished diameter of 18-feet including drop shafts, near surface consolidation sewers, and associated infrastructure. | Comply with a Federal Consent Decree. |
| Pleasant Run Deep Tunnel | 92TU00534 | Construct approximately 39,200 linear feet of deep rock CSO storage tunnel with a finished diameter of 18-feet including drop shafts, near surface consolidation sewers, and associated infrastructure. | Comply with a Federal Consent Decree. |
| Rockville Rd - High School Rd STEP | 92SP00555 | Install grinder pumps and a low pressure sewer system to replace failing septic tanks and make sewer service available to approximately 221 properties. | Improve water quality by decreasing contamination from failing septic tanks. |
| Thompson Rd - Meridian St STEP | 92SP01652 | Install grinder pumps and a low pressure sewer system to replace septic tanks and make sewer service available to approximately 465 properties. | Improve water quality by decreasing contamination from failing septic tanks. |
| 72nd St - Westfield Blvd STEP | 92SP02111 | Install grinder pumps and a low pressure sewer system to replace septic tanks and make sewer service available to approximately 61 properties. | Improve water quality by decreasing contamination from failing septic tanks. |
| 71st St - Tuxedo Ave STEP | 92SP02175 | Install grinder pumps and a low pressure sewer system to replace septic tanks and make sewer service available to approximately 447 properties. | Improve water quality by decreasing contamination from failing septic tanks. |
| 79th St - Keystone Ave STEP | 92SP02176 | Install grinder pumps and a low pressure sewer system to replace septic tanks and make sewer service available to approximately 48 properties. | Improve water quality by decreasing contamination from failing septic tanks. |
| 42nd St - German Church STEP | 92SP02177 | Install grinder pumps and a low pressure sewer system to replace septic tanks and make sewer service available to approximately 6 properties. | Improve water quality by decreasing contamination from failing septic tanks. |
| 77th St - Dean Rd STEP | 92SP02178 | Install grinder pumps and a low pressure sewer system to replace septic tanks and make sewer service available to approximately 107 properties. | Improve water quality by decreasing contamination from failing septic tanks. |
| 21st St - Post Rd STEP | 92SP02179 | Install grinder pumps and a low pressure sewer system to replace septic tanks and make sewer service available to approximately 18 properties. | Improve water quality by decreasing contamination from failing septic tanks. |
| 58th St - Stone Hill Dr STEP | 92SP02180 | Install grinder pumps and a low pressure sewer system to replace septic tanks and make sewer service available to approximately 11 properties. | Improve water quality by decreasing contamination from failing septic tanks. |
| 46th St - Ritter Ave STEP | 92SP03230 | Install grinder pumps to make sanitary sewer service available to approximately 25 properties. | Improve water quality by decreasing contamination from failing septic tanks. |
| STEP (Septic Tank Elimination Program) Projects | AB92SP | An assignable balance to account for pending spend throughout the fiscal year should need arise. | An assignable balance to account for pending spend throughout the fiscal year. |
| Bridgeport Storage Tank | 92IN03213 | Construct a storage tank to address capacity limitations in the Bridgeport Interceptor. | Reduce sanitary sewer overflows. |
| Lift Station 522 Replacement | 92LS01969 | Replace lift station due to corrosion of the metal dry well, non-standard equipment and insufficient capacity during wet weather. | Reduce safety hazards of a deteriorated wet well, improve operation and maintenance and reduce high wet well alarms. |
| LS 520 Replacement | 92LS02595 | Replace lift station due to corrosion of the metal dry well, non-standard equipment and inaccessibility during inclement weather. | Reduce safety hazards of a deteriorated wet well and improve access for operation and maintenance. |
| LS 518 Replacement | 92LS02671 | Replace lift station due to corrosion of the metal dry well, non-standard equipment and inaccessibility during inclement weather. | Reduce safety hazards of a deteriorated wet well and improve access for operation and maintenance. |
| LS 503 Replacement | 92LS02672 | Replace lift station due to corrosion of the metal dry well and non-standard equipment. | Reduce safety hazards of a deteriorated wet well and improve operation and maintenance. |
| LS 516 Replacement | 92LS02673 | Replace lift station due to corrosion of the metal dry well and non-standard equipment. | Reduce safety hazards of a deteriorated wet well and improve operation and maintenance. |
| LS 511 Replacement | 92LS02675 | Replace lift station due to corrosion of the metal dry well and non-standard equipment. | Reduce safety hazards of a deteriorated wet well and improve operation and maintenance. |

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| LS 418 Replacement | 92LS02676 | Replace lift station due to corrosion of the metal dry well and non-standard equipment. | Reduce safety hazards of a deteriorated wet well and improve operation and maintenance. |
| LS 101 Capacity Upgrade | 92LS02679 | Increase capacity, install new force main, and modify the existing lift station. | Reduce sanitary sewer overflows and improve station operation. |
| LS 517 Replacement | 92LS02680 | Replace lift station and force main due to corrosion of the metal dry well and declining pumping capacity. | Reduce sanitary sewer overflows and improve operation and maintenance. |
| LS 412 Replacement | 92LS02682 | Upgrade station's electrical system due to aged infrastructure and insufficient operation of the pumps and variable frequency drives. | Reduce high wet well alarm events and improve operation and maintenance. |
| LS 113 Replacement | 92LS02684 | Replace lift station due to corrosion of the metal dry well, non-standard equipment and inaccessibility during inclement weather. | Reduce safety hazards of a deteriorated wet well and improve access for operation and maintenance. |
| LS 419 Replacement | 92LS02685 | Replace lift station due to corrosion of the metal dry well and non-standard equipment. | Reduce safety hazards of a deteriorated wet well and improve operation and maintenance. |
| LS 421 Replacement | 92LS02686 | Replace lift station due to corrosion of the metal dry well, non-standard equipment, and accessibility issues. | Reduce safety hazards of a deteriorated wet well and improve access for operation and maintenance. |
| LS 563 Replacement | 92LS02687 | Replace lift station due to corrosion of the metal dry well, non-standard equipment, and aged electrical and mechanical equipment. | Reduce safety hazards of a deteriorated wet well, reduce sanitary sewer overflows, and improve operation and maintenance. |
| LS 104 Replacement | 92LS02957 | Replace lift station due to corrosion of the metal dry well and non-standard equipment. | Reduce safety hazards of a deteriorated wet well, improve operation and maintenance, and reduce high wet well alarms. |
| LS 422 Replacement | 92LS03199 | Replace lift station due to corrosion of the metal dry well and non-standard equipment. | Reduce safety hazards of a deteriorated wet well and improve operation and maintenance. |
| LS 545 Replacement | 92LS03201 | Replace lift station due to corrosion of the metal dry well and non-standard equipment. | Reduce safety hazards of a deteriorated wet well and improve operation and maintenance. |
| LS 509 Replacement | 92LS03203 | Replace lift station due to corrosion of the metal dry well and non-standard equipment. | Reduce safety hazards of a deteriorated wet well and improve operation and maintenance. |
| LS 204 Replacement | 92LS03204 | Replace lift station due to corrosion of the metal dry well, non-standard equipment and inaccessibility during inclement weather. | Reduce safety hazards of a deteriorated wet well and improve access for operation and maintenance. |
| LS 308 Replacement | 92LS03205 | Replace lift station due to corrosion of the metal dry well, non-standard equipment, and aged mechanical equipment. | Reduce safety hazards of a deteriorated wet well and improve operation and maintenance. |
| LS 500 Replacement | 92LS03207 | Replace lift station due to corrosion of the metal dry well and non-standard equipment. | Reduce safety hazards of a deteriorated wet well and improve operation and maintenance. |
| LS 401 Replacement | 92LS03208 | Replace lift station due to corrosion of the metal dry well and non-standard equipment. | Reduce safety hazards of a deteriorated wet well, improve operation and maintenance, and reduce high wet well alarms. |
| Osceola Ct Sewer Replacement | 92MD03155 | Replace approximately 670 feet of vitrified clay pipe, due to severe pipe sags, offset joints, and roots. | Reduce sanitary sewer overflows. |
| Summerfield Dr FM Dis. Rehab | 92RR02607 | Rehabilitate approximately 580 feet of 21 inch diameter sewer and associated manholes due to corrosion caused by hydrogen sulfide in the discharge from three upstream lift station force mains. | Renew deteriorated pipes and reduce the risk of sewer failure due to corrosion. |
| N College Ave-W South St LDSR | 92RR02609 | Rehabilitate approximately 3,000 feet of sewers, ranging in size from 24 to 48 inches, and associated manholes. | Renew the aging sewer infrastructure and reduce the risk of sewer failure due to structural issues. |
| W Merrill St-S East St LDSR | 92RR02678 | Rehabilitate approximately 1,400 feet of sewers, ranging in size from 20 to 48 inches, and associated manholes. | Renew the aging sewer infrastructure and reduce the risk of sewer failure due to structural issues. |

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| E 30th St LDSR | 92RR02688 | Rehabilitate approximately 700 feet of 69 inch diameter sewer and associated manholes. | Renew the aging sewer infrastructure and reduce the risk of sewer failure due to structural issues. |
| EPRPSD-Michigan-E 19 St LDSR | 92RR02690 | Rehabilitate approximately 6,000 feet of sewers, ranging in size from 20 to 48 inches, and associated manholes. | Renew the aging sewer infrastructure and reduce the risk of sewer failure due to structural issues. |
| Pennsylvania St-Ohio St LDSR | 92RR02691 | Rehabilitate approximately 5,600 feet of sewers, ranging in size from 24 to 54 inches, and associated manholes. | Renew the aging sewer infrastructure and reduce the risk of sewer failure due to structural issues. |
| Fall Creek - 17 | 92RR02863 | Rehabilitate approximately 25,200 feet of sewers, ranging in size from 8 to 18 inches, and associated manholes. | Renew the aging sewer infrastructure and reduce the risk of sewer failure due to structural issues. |
| LeGrande Ave-Naomi St LDSR | 92RR02864 | Rehabilitate approximately 4,900 feet of sewers, ranging in size from 20 to 60 inches, and associated manholes. | Renew the aging sewer infrastructure and reduce the risk of sewer failure due to structural issues. |
| Sanders St-CSO 149 LDSR | 92RR02865 | Rehabilitate approximately 3,900 feet of sewers, ranging in size from 18 to 54 inches, and associated manholes. | Renew the aging sewer infrastructure and reduce the risk of sewer failure due to structural issues. |
| Hague Rd FM Dis. Rehab | 92RR02866 | Rehabilitate approximately 960 feet of 12 inch diameter sewer and associated manholes due to corrosion caused hydrogen sulfide in the discharge from two upstream lift station force mains. | Renew the deteriorated sewer infrastructure and reduce the risk of sewer failure due to corrosion. |
| Prospect St Phase II LDSR | 92RR03161 | Rehabilitate approximately 200 feet of sewers, ranging in size from 24 to 26 inches, and associated manholes. | Renew the aging infrastructure and reduce the risk of sewer failure due to structural issues. |
| State Ave LDSR (cross bore) | 92RR03200 | Rehabilitate approximately 400 feet of 24 inch diameter sewer. | Renew the aging infrastructure and reduce the risk of sewer failure due to structural issues. |
| 20th and Broadway LDSR | 92RR03202 | Rehabilitate approximately 1,300 feet of sewers, ranging in size from 20 to 24 inches, and associate manholes. | Renew the aging infrastructure and reduce the risk of sewer failure due to structural issues. |
| CSO 103 SDR | 92RR03209 | Rehabilitate approximately 15,300 feet of sewers ranging in size from 8 to 15 inches. | Renew the aging infrastructure and reduce the risk of sewer failure due to structural issues. |
| Burbank Rd SDR | 92RR03210 | Rehabilitate approximately 200 feet of 12 inch diameter sewer and associated manholes. | Renew the aging infrastructure and reduce the risk of sewer failure due to structural issues. |
| Brooks St SDR (cross bore) | 92RR03211 | Rehabilitate approximately 400 feet of 18 inch diameter sewer and associated manholes. | Renew the aging infrastructure and reduce the risk of sewer failure due to structural issues. |
| Misc Interceptor Expansions & Improvements | AB92IN | Assignable balance to account for spending anticipated throughout the year based on historical or expected needs. | Ensure funding for pending spend on interceptors. |
| Lift Station Rehab Design | AB92LS | Assignable balance to account for spending anticipated throughout the year based on historical or expected needs. | Ensure funding for pending spend to rehab lift stations. |
| Collection System MCI | AB92MD | Assignable balance to account for spending anticipated throughout the year based on historical or expected needs. | Ensure funding for pending spend to minor collection system improvements. |
| Manhole Rehabilitation | AB92MH | Assignable balance to account for spending anticipated throughout the year based on historical or expected needs. | Ensure funding for pending spend to rehabilitate manholes. |
| PI-Sanitary Sewer Relocations | AB92PI | Assignable balance to account for spending anticipated throughout the year based on historical or expected needs. | Ensure funding for pending spend to relocate sewers for public improvement projects. |
| Misc Large Diameter SS&CS Rehab | AB92RRL | Assignable balance to account for spending anticipated throughout the year based on historical or expected needs. | Ensure funding for pending spend to rehab large diameter sewers. |
| Misc Sm Diam SS & CS Rehab | AB92RRS | Assignable balance to account for spending anticipated throughout the year based on historical or expected needs. | Ensure funding for pending spend to rehab small diameter sewers. |

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| 2019 WW Fleet Purchases | 92FL03341 | Purchase of various vehicles and equipment for CWA. | Provide vehicles and equipment needed to maintain the wastewater system. |
| AB Misc Facilities | AB92FA | Based on historical needs, anticipated work on existing wastewater physical facilities (i.e., buildings, roads, etc.). | Maintain CWA facilities. |
| Wastewater Fleet Replacement | AB92FL | Based on historical needs, anticipated work to purchase of various vehicles and equipment for CWA. | Provide vehicles and equipment needed to maintain the wastewater system. |
| WW Safety & Security | AB92SE | Based on historical needs, anticipated work for wastewater related safety or security upgrades. | Maintain and/or upgrade safety and security equipment at CWA facilities. |
| SCADA Upgrade | 92LS03212 | Implement SCADA at Lift Stations 546, 547, 548, 553, and 559. | Provide telecommunication between Operations and the stations to improve Operations' response time and address immediate concerns. |
| WAM Program - WW | 92SF01733 | Configure, develop and deploy a work and asset management. | Track assets to improve maintenance activities and replacement decisions. |
| AMTS Data Collection Equipment | AB92AM | Assignable balance to account for spending anticipated throughout the year based on historical or expected needs. | Ensure funding for pending spend on sanitary system data collection. |
| Misc WW Technology Projects | AB92MT | Assignable balance to account for spending anticipated throughout the year based on historical or expected needs. | Ensure funding for pending spend on technology projects for the sanitary system. |

Cause No. 45151
Responses of CWA Authority Inc.
Office of Utility Consumer Counselor's
Tenth Set of Data Requests

DATA REQUEST NO. 12:

Who is responsible for the cost of the grinder pump as part of the STEP projects?

RESPONSE:

CWA is responsible for the initial purchase and installation of materials and equipment (including grinder pumps) for STEP projects if a customer enrolls during the STEP project installation period. Detailed information is included in the STEP enrollment agreement which is attached as: OUCC DR 10.12 – STEP Program Enroll Agrmt Template (F)

WITNESS:

Mark C. Jacob

SEPTIC TANK ELIMINATION PROGRAM ("STEP") ENROLLMENT AGREEMENT

This STEP Enrollment Agreement (the "Agreement") is made and entered into this ____ day of _____ 20__ by and between the Department of Public Utilities of the City of Indianapolis, as trustee for the Wastewater System, doing business as Citizens Energy Group, hereinafter referred to as "Citizens," and _____, hereinafter referred to as "Customer," with an address of [insert address where Work is to be performed]: _____, hereinafter referred to as "Customer Property."

WHEREAS, Citizens is performing a Septic Tank Elimination Program ("STEP") Project called <<Project Name>> STEP in Customer's neighborhood (the "Project"), and Citizens is offering to have its contractor perform certain Work for Customer in exchange for Customer making the Payment and granting the Right of Entry (all as defined below); and,

WHEREAS, Customer desires to accept the offer and make the Payment and grant the Right of Entry in order to obtain sanitary sewer services from Citizens;

NOW, THEREFORE, the parties agree as follows:

1. Work.

"**Work**" means: Through Citizens' sewer main construction contractor and its subcontractors, installing a Building Sewer (also known as a sewer lateral) and performing all steps required to connect Customer's residence to the Sewage Disposal System per the Wastewater Terms and Conditions (Appendix B); excavating a pit of approximately 10 ft. x 10 ft. x 10 ft.; procuring and installing a grinder pump; connecting the grinder pump to Customer's electrical panel and, if necessary, making only such minor upgrades (that is, addition of a circuit breaker and a new wire connection valued at up to \$100 for parts) to Customer's electrical panel as are needed for the operation of the grinder pump; abandoning the Customer's existing septic tank; and, if Customer has a warranty claim as to the workmanship of the installation, performing work to correct the defect in workmanship as described below in Section 6.

2. Offer; Payment Terms; Discontinuance of Service for Non-Payment.

A. 60-Day Offer. Citizens will cause its contractor to perform the Work only if Customer accepts the offer within 60 days after the last public meeting about the Project on <<Last Public Meeting Date>> (the "**60-Day Offer**") and agrees to make the **60-Day Offer Payment** as set forth below, in sub-section C. The "**60-Day Offer Payment**" means Two Thousand Seven Hundred Sixty-Six Dollars (\$2,766.00), which is the sum of the following:

- \$2,530 for the baseline Connection Fee (see the Wastewater Terms and Conditions, Appendix B); and,
- \$236 for the Building Sewer Application and Permit Fee (see the Wastewater Terms and Conditions, Appendix B).

Citizens' contractor will not perform the Work until Customer has selected one of the two payment options in sub-section C.

B. Final Offer. If Customer does not accept the 60-Day Offer, then Citizens will cause its contractor to perform the Work only if Customer accepts the **Final Offer** and makes the **Final Offer Payment**. The "**Final Offer**" means accepting the offer before the "Final Offer Date," which is scheduled to be <<Substantially Complete Date>>. The "**Final Offer Payment**" means (i) the Two Thousand Seven Hundred Sixty-Six Dollars (\$2,766.00) described in the 60-Day Offer, **plus** (ii) an additional Five Hundred Dollars (\$500) as the direct pass-through cost to Citizens for having its contractor perform the Work after the 60-Day Offer and before the Final Offer Date. Citizens' contractor will not perform the Work until Customer has made the \$500 portion of the **Final Offer Payment** and selected one of the two payment options sub-section C. for the \$2,766 portion.

C. Customer agrees to pay the \$2,766 as follows [choose one option]:

- _____ (a) in one lump sum payment on or before the due date on the confirmation that Citizens will send to Customer (the "Due Date"); or,
_____ (b) in sixty (60) equal monthly installments of Forty-Six Dollars and Ten Cents (\$46.10).

If Customer chooses the lump sum payment in option (a), Customer agrees that if Customer does not make the lump sum payment on or before the Due Date, then Customer will make payments according to the installment payments in option (b).

The installment payments will begin with Customer's first bill for sanitary sewer services and continue for each consecutive billing period until the \$2,766 is paid in full. Customer understands that if Customer fails to make any installment payment, then Citizens shall have the right to disconnect Customer's sewer or water service until any outstanding balance has been paid.

3. Right of Entry.

For the purposes stated herein and for no other purpose, Customer grants to Citizens, its contractor, and its contractor's subcontractors a right of entry onto the Customer Property for the purposes of performing the Work. If Citizens' contractor identifies an obstruction or other structure that is or will prevent it from being able to complete the Work, then it will notify Customer, and the contractor and Customer will agree on how to remove the obstruction or other structure or a reasonable way to work around it. Citizens (or one of its contractors) will restore the Customer Property as close to its original condition as reasonably possible, including placing grass seed on any grassy areas impacted as part of the Work.

4. Assignment.

Customer is not allowed to assign this Agreement to any other person.

5. Customer Representation and Warranties.

Customer represents and warrants that he or she is, or they are, the owner(s) of the Customer Property and therefore has (or have) sole and exclusive right to grant and convey the Right of Entry described above and to provide Citizens, its contractor, and its contractor's subcontractors with all rights and privileges necessary to complete the Work. Only the owner(s) of the Customer Property are allowed to enter into this Agreement. Renters and others are not allowed to sign this Agreement.

6. Warranty on Workmanship.

Citizens warrants the workmanship of the Work for three years from the date the Work was originally performed. Customer is responsible for maintaining the grinder pump in accordance with the terms of the manufacturer's limited warranty.

7. Miscellaneous.

a. Governing Law; Litigation.

This Agreement shall be governed by and enforced in accordance with the laws of the State of Indiana. Litigation associated with or arising under this Agreement is allowed to be filed only in the state courts located in Indianapolis, Indiana.

b. Environmental Liability.

Customer agrees that neither Citizens nor its contractor nor its contractor's subcontractors shall be liable for environmentally related claims arising from or related to conditions on the Customer Property prior to the beginning of the Work.

c. Entire Agreement; Amendments.

This Agreement and the Wastewater Terms and Conditions are the documents that set forth the entire agreement and understanding between Customer and Citizens. Customer and Citizens agree that no other agreements or promises, verbal or written, exist between them. This Agreement may be amended only by the express, written agreement of both Customer and Citizens.

8. Notice.

For Customers who choose the option (a) lump sum payment in Section 2.C., Citizens will send Customer the confirmation and Due Date for the Payment, and the acknowledgment of receipt of that Payment, to Customer's e-mail address at:

Other notices given pursuant to this Agreement will be in writing and either mailed by regular or certified mail or delivered by a nationally recognized overnight courier service to the other party's address as follows:

If to Customer: Notice to Customer will go to the Customer Property address unless Customer's residential or business address is different. If so, please insert Customer's preferred address for notice below:

If to Citizens: Citizens Energy Group
2020 North Meridian Street
Indianapolis, Indiana 46202
ATTN: STEP Enrollment

9. Offer Only Valid Until Date Stated Below.

A. The **60-Day Offer** shall be valid only for 60 days after the last public meeting about the Project on <<Last Public Meeting Date>>. The **60-Day Offer** expires at 5 p.m. on the 60th day after that date. In other words, Citizens will have no obligation to anyone who does not return a signed Agreement to Citizens before 5 p.m. on that date.

B. The **Final Offer** shall be valid only until Final Offer Date, which is scheduled to be <<Substantial Completed Date>>. In other words, Citizens will have no obligation to anyone who does not return a signed Agreement to Citizens before 5 p.m. on that date.

C. Either form of offer, even after acceptance, is terminable by Citizens on thirty (30) days' notice in the event of a breach of this agreement, or of any of its terms, which remain uncured by Customer at the end of such notice period.

IN WITNESS WHEREOF, the parties have duly executed and delivered this Agreement as of this ____ day of _____ 20__.

CUSTOMER:

CITIZENS ENERGY GROUP:

Signature(s) / Date

Signature / Date

Director, Customer Relationships
Title

Print Name(s)

Gregory A. Sawyers
Print Name

Address

CUSTOMER Phone Number

Cause No. 45151
Responses of CWA Authority Inc.
Office of Utility Consumer Counselor's
Tenth Set of Data Requests

DATA REQUEST NO. 13:

Please provide a copy of the Septic Tank Elimination Program (STEP) Enrollment Agreement.

RESPONSE:

See the materials provided in response to Data Request No. 10.12.

WITNESS:

N/A

Cause No. 45151
Responses of CWA Authority Inc.
Office of Utility Consumer Counselor's
Tenth Set of Data Requests

DATA REQUEST NO. 14:

On page 51 of Korlon Kilpatrick's testimony he states that "Petitioner has made changes to its septic tank elimination program that make it easier for customers to connect."

Please explain what changes have been made to CWA's septic tank elimination program that make it easier for customers to connect.

RESPONSE:

Prior to 2016, the STEP projects included design and installation of predominantly gravity sewer systems in the public right-of-way. Customers were responsible for hiring their own plumber and obtaining a permit to connect to the new public sewer. Initial connection rates varied but averaged approximately 45% of premises in the project limits. Customer feedback was also received on the variations in cost per plumber and difficulty in connecting. CWA evaluated the program effectiveness and costs and implemented many changes to address these issues. CWA now works directly with every customer on connecting to the public sewer and a flat fee was established. Customer connection rates have now exceeded 98% of premises in project limits on average in 2016-2017.

WITNESS:

Korlon L. Kilpatrick II
Mark C. Jacob

Cause No. 45151
Responses of CWA Authority Inc.
Office of Utility Consumer Counselor's
Tenth Set of Data Requests

DATA REQUEST NO. 15:

In addition to the "Connection Fee" of \$2,530.00, what additional fees or charges are imposed on a new customer as a result of a STEP project? Please identify the specific charge/fee and the amount of the fee/charge. (e.g. Building Sewer Fees and/or Sanitary Sewer Facility Fees)

RESPONSE:

As outlined in the STEP enrollment agreement, customers are also charged a building sewer application and permit fee of \$236.00. The total charge is \$2,766.00, which can be paid in one final payment or over 60 equal monthly payments of \$46.10. The STEP enrollment agreement is provided in Response to Data Request No. 10.12.

WITNESS:

Mark C. Jacob

Cause No. 45151
Responses of CWA Authority Inc.
Office of Utility Consumer Counselor's
Tenth Set of Data Requests

DATA REQUEST NO. 16:

On page 17 of Mark Jacobs' testimony, he states that "[t]hrough value engineering, CWA has changed the construction practices of the STEP projects from primarily gravity systems to predominantly low-pressure systems." Is CWA proposing to only install low-pressure systems for all future STEP projects? Please provide all value engineering studies performed on STEP projects over the last five (5) years.

RESPONSE:

Petitioner objects to the foregoing Data Request on the grounds that the request for "all value engineering studies performed on STEP projects" is vague and ambiguous and depending on its intended meaning overly broad and unduly burdensome. Subject to and without waiving the foregoing objection, Petitioner submits the response set forth below.

Yes. CWA plans to install only low pressure sewer systems for the remainder of the high priority program outlined in the STEP White Paper. The STEP White Paper is provided as Data Request 10.16 that presents the overall value engineering approach to the STEP program savings.

WITNESS:

Mark C. Jacob

Cause No. 45151
Responses of CWA Authority Inc.
Office of Utility Consumer Counselor's
Tenth Set of Data Requests

DATA REQUEST NO. 17:

What is the cost to a new customer for the purchase of a grinder pump unit as a result of a STEP project?

RESPONSE:

Petitioner incorporates herein by reference its response to Data Request No. 10.15.

WITNESS:

Mark C. Jacob

Cause No. 45151
Responses of CWA Authority Inc.
Office of Utility Consumer Counselor's
Tenth Set of Data Requests

DATA REQUEST NO. 18:

Does CWA offer potential customers a choice of grinder pump units to install as a result of a STEP project? (i.e. a choice between different manufacturers of grinder pump units, pumps or pump capacity)

RESPONSE:

No. Grinder pumps are purchased in bulk through a Citizens Energy Group Supply Chain solicitation event. Multiple vendors are invited and the grinder pump system is selected based on a best value approach. During the STEP enrollment process, each participating customer is interviewed to ensure the grinder pump system installed at their premise is suitable based on their reported wastewater quantities.

WITNESS:

Mark C. Jacob

Cause No. 45151
Responses of CWA Authority Inc.
Office of Utility Consumer Counselor's
Tenth Set of Data Requests

DATA REQUEST NO. 19:

Is a new customer required to purchase a grinder pump system from CWA for a STEP project? If not, does CWA have specifications on the type and size of grinder pump units that can be used in the low-pressure system?

RESPONSE:

No. A new customer may opt to purchase their own grinder system and install it once the main line is available for connection. CWA provides the customer the grinder pump system requirements when they apply for connection to the public sewer system (in a low pressure service area).

WITNESS:

Mark C. Jacob

Cause No. 45151
Responses of CWA Authority Inc.
Office of Utility Consumer Counselor's
Tenth Set of Data Requests

DATA REQUEST NO. 20:

In its Septic Tank Elimination Program (STEP) Guide, dated 12/07/2017 and available on the Citizens Energy Group website, it states that “[i]f properly maintained, the average life of a grinder pump is 20 years.” Please explain how CWA determined the average life of the grinder pump is 20 years. Please provide all documentation that support an average life of 20 years.

RESPONSE:

The average life of a grinder pump was determined to be 20 years based on an operations and expenses evaluation completed by the Environment One Corporation, which also includes comparison to the Water Environment Research Foundation's C-2 Fact Sheet for low pressure sewer systems. A copy of the evaluation is attached as: “OUCC DR 10.20 - OM Expenses Evaluation for Pressure Sewers.”

WITNESS:

N/A

Cause No. 45151
Responses of CWA Authority Inc.
Office of Utility Consumer Counselor's
Tenth Set of Data Requests

DATA REQUEST NO. 21:

Please describe what "proper maintenance" is expected to be performed for a grinder pump to last 20 years.

RESPONSE:

Maintenance or "proper maintenance" associated with grinder pump stations includes the owner scheduling service calls for pump unit alarms and allowing repairs, if needed. Information regarding operations and maintenance expectations is provided in the response attachment to Data Request No. 10.20.

WITNESS:

N/A

Cause No. 45151
Responses of CWA Authority Inc.
Office of Utility Consumer Counselor's
Tenth Set of Data Requests

DATA REQUEST NO. 22:

Will this maintenance be the responsibility of the homeowner?

RESPONSE:

As outlined in the STEP enrollment agreement provided in response to Data Request No. 10.12, a full grinder system warranty is provided by CWA for three years following the date of original installation. Customers are responsible for maintenance and repairs beyond the three year warranty period.

WITNESS:

N/A

Cause No. 45151
Responses of CWA Authority Inc.
Office of Utility Consumer Counselor's
Tenth Set of Data Requests

DATA REQUEST NO. 23:

What does CWA estimate the average annual maintenance costs for a grinder pump unit will be?

RESPONSE:

As set forth in the attachment provided in the response to Data Request No. 10.20, CWA uses a conservative estimate of \$50 per year for average annual maintenance costs for grinder pump units.

WITNESS:

N/A

Cause No. 45151
Responses of CWA Authority Inc.
Office of Utility Consumer Counselor's
Tenth Set of Data Requests

DATA REQUEST NO. 24:

Will CWA require homeowners to use specific contractors to perform the maintenance?

RESPONSE:

No. Licensed plumbers should be capable of performing any required maintenance or repairs.

WITNESS:

N/A

Cause No. 45151
Responses of CWA Authority Inc.
Office of Utility Consumer Counselor's
Tenth Set of Data Requests

DATA REQUEST NO. 25:

What pump is included in the grinder pump unit sold/installed by CWA? Please indicate the pump manufacturer, model and specifications sheet for the pump.

RESPONSE:

Currently, CWA provides the Environment One Corporation's grinder pump model called the Extreme series. The Extreme series pump model DH 071 is used in single family home residential applications, and the specification is attached as "OUCC DR 10.25 - Section 11105 - Grinder Pump Station Unit Specification."

WITNESS:

N/A

Cause No. 45151
Responses of CWA Authority Inc.
Office of Utility Consumer Counselor's
Tenth Set of Data Requests

DATA REQUEST NO. 26:

What does CWA estimate the average annual electric cost to power a grinder pump unit?

RESPONSE:

Based on average residential usage, 8 kilowatt hours are used per month to operate the grinder pump unit. Based on the cost of \$0.12 per kilowatt hour, the current average cost per year to power the grinder pump unit is about \$12.00. The annual cost may vary based on actual electricity rates in the future.

WITNESS:

N/A

Cause No. 45151
Responses of CWA Authority Inc.
Office of Utility Consumer Counselor's
Tenth Set of Data Requests

DATA REQUEST NO. 27:

Please provide any studies or analysis CWA performed to determine which grinder pump unit was the best value for new customers as a result of a STEP project.

RESPONSE:

Petitioner objects to the foregoing Data Request to the extent it seeks confidential and proprietary information regarding the selection of vendors that could be used as leverage in future negotiations with vendors. Subject to and without waiving the foregoing objection, Petitioner submits the response set forth below.

CWA engaged a technical consultant to study the various technologies available that could be applicable for STEP projects. The consultant's research and analysis discussed in the memorandum attached as "OUCC DR 10.27 - STEP Technologies Memorandum (F)", which concludes that a low pressure sewer system ("LPSS") provided the overall best value. Due to the competitive status of the LPSS market, the consultant recommended a competitive sourcing event to ensure CWA received the best pricing and value for customers. CWA conducted a competitive sourcing event per the recommendation in the attached memorandum. Five qualified LPSS suppliers were invited to participate in the event, and the best value supplier was selected.

The scoring sheet for that competitive sourcing event also is attached as "OUCC DR 10.27 - LPSS Solicitation Final Scoring Sheet" pursuant to the Nondisclosure Agreement entered into between Petitioner and the OUCC. The scoring sheet shows how the current LPSS supplier was selected based on the event's scoring criteria and if disclosed could be used to the detriment of CWA and its customers in the selection of future providers.

WITNESS:

N/A

Cause No. 45151
Responses of CWA Authority Inc.
Office of Utility Consumer Counselor's
Eleventh Set of Data Requests

DATA REQUEST NO. 5:

Please state the number of sanitary sewer overflows ("SSOs") that have occurred in CWA's collection system by year since 2011.

RESPONSE:

| | |
|------|-----|
| 2011 | 227 |
| 2012 | 87 |
| 2013 | 112 |
| 2014 | 89 |
| 2015 | 114 |
| 2016 | 68 |
| 2017 | 99 |
| 2018 | 91 |

WITNESS:

N/A

Cause No. 45151
Responses of CWA Authority Inc.
Office of Utility Consumer Counselor's
Eleventh Set of Data Requests

DATA REQUEST NO. 6:

For each year from 2011 to the present, please state the number of homes that connected to CWA's system under the STEP.

RESPONSE:

| Year | STEP Home Connections |
|------|-----------------------|
| 2011 | 1187 |
| 2012 | 922 |
| 2013 | 3312 |
| 2014 | 149 |
| 2015 | 640 |
| 2016 | 609 |
| 2017 | 356 |
| 2018 | 32 |

WITNESS:

Mark C. Jacob

Cause No. 45151
Responses of CWA Authority Inc.
Office of Utility Consumer Counselor's
Eleventh Set of Data Requests

DATA REQUEST NO. 7:

For each year from 2011 to the present, please state the annual cost for the STEP and provide the total cumulative STEP cost for CWA Authority.

RESPONSE:

| Fiscal Year | Amount |
|--------------------|---------------|
| 2011 | \$30,011,356 |
| 2012 | \$63,791,794 |
| 2013 | \$31,357,716 |
| 2014 | \$6,821,802 |
| 2015 | \$14,203,700 |
| 2016 | \$10,916,070 |
| 2017 | \$12,400,362 |
| 2018 | \$1,314,403 |
| Total | \$170,817,203 |

WITNESS:

Mark C. Jacob

To: Jessica Bastin, P.E., Citizens Energy Group
Joe Nagy, Citizens Energy Group

From: Jeff Glover, P.E., Black & Veatch
Bruce Cooley, P.E., Black & Veatch

PURPOSE

The purpose of this memorandum is to provide a high-level evaluation and recommendation for technology to be used in the Citizens Energy Group (Citizens) Septic Tank Elimination Program (STEP).

BACKGROUND

More than 17,000 homes in Marion County are serviced by private septic systems. Septic systems have a limited life and eventually fail, seeping human waste into groundwater, backyards, neighborhood ditches, and local streams. As such, Citizens is continuing the City of Indianapolis' efforts to provide sanitary sewer services to unsewered neighborhoods through the Septic Tank Elimination Program (STEP).

STEP TECHNOLOGY OPTIONS

Septic Tank Elimination technologies are broadly categorized as gravity systems, vacuum systems, or low pressure systems. Each category of technology may be suitably utilized by Citizens for the elimination of septic tanks; however, capital costs and system operation and maintenance (O&M) must be considered together before a right-sized solution can be recommended.

Gravity Systems

Gravity systems are designed systems where sanitary flow is intercepted upstream of the septic tank by way of individual sanitary laterals. Sanitary flow progresses to trunk sewers within the street or alleyway and is received at the treatment facility, predominately by way of gravity flow. Gravity systems require precise elevations to be maintained throughout the system to operate effectively. In many areas, lift stations are also required to account for area topography.

Gravity sewers are typically installed by way of open-cut excavations approximately 5 to 20 feet below the finished floor elevation of the adjacent homes. As a result, gravity sewers are relatively expensive and construction is very disruptive to neighborhoods. Capital costs for gravity sewers include installation of gravity laterals, gravity main line sewers, sanitary manholes, and lift stations and appurtenances (as required). Gravity systems would require minimal long-term maintenance by Citizens; however, the inclusion of lift stations in the system can appreciably increase the annual O&M cost. Relative to the other STEP Technology options considered, gravity sewers require a high capital investment and low-to-moderate annual O&M expenses borne by Citizens. A typical schematic of a gravity system is presented on Figure 1.

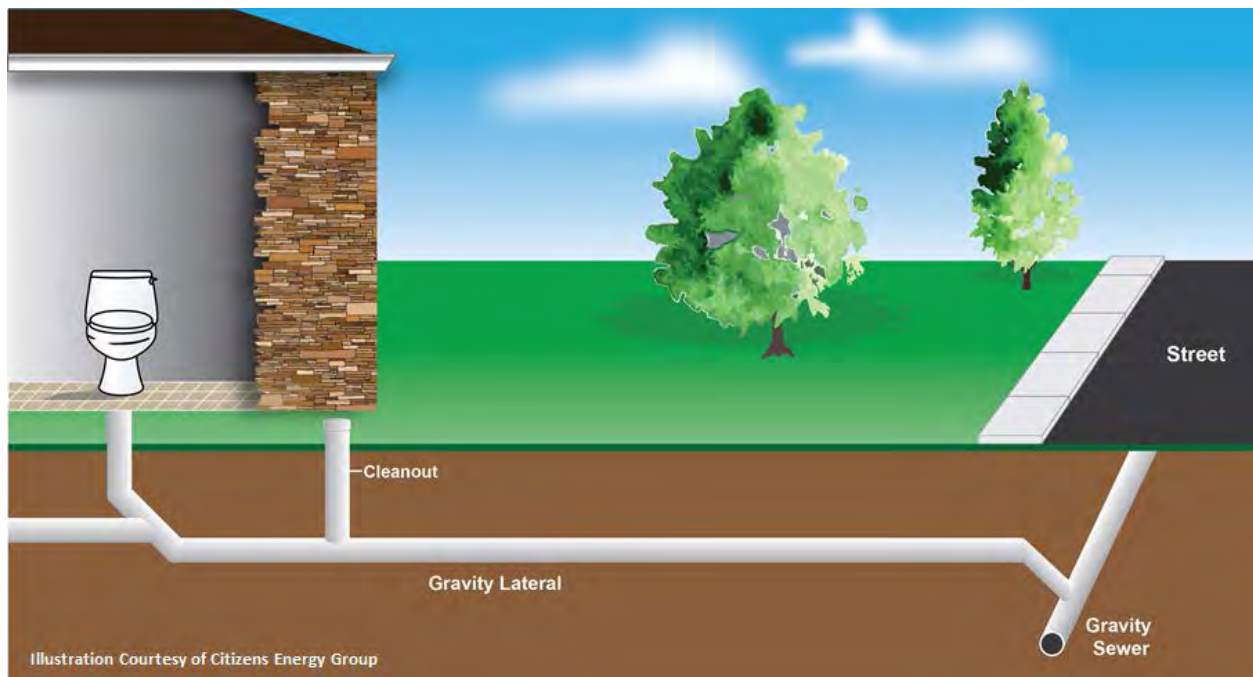


Figure 1 Typical Schematic of a Gravity Sewer System

Vacuum Systems

Vacuum systems utilize differential pressure to transport sanitary flow to a localized vacuum system station. Sanitary flow is intercepted upstream of the septic tank and diverted into a vacuum pit located adjacent to the residence. Differential pressure within the vacuum pit caused by accumulated flow triggers the opening of a pneumatic valve within the vacuum pit. The downstream vacuum system draws flow from multiple vacuum pits to a large holding tank in the vacuum system station. The holding tank operates as a traditional lift station, pumping sanitary flow to the collection system.

Installation of the vacuum main (from the vacuum pit to the vacuum system station) requires a saw-toothed installation, as seen in Figure 2, to ensure partial vacuum is maintained within the system at all times. A force main is required from the vacuum system station to the discharge point in the collection system. Piping can usually be installed in a relatively shallow, open-cut excavation. Capital costs for these systems include vacuum pits and the associated residential appurtenances, vacuum laterals, vacuum mains (saw-toothed pipe installation), centralized vacuum system stations and appurtenances, and force mains. O&M costs would be incurred by Citizens for maintenance of the vacuum mains, the vacuum pump, the force main pumps, and ancillary expense related to the vacuum system station, such as lighting, heating, ventilation, and air conditioning, and similar. Of the STEP technologies considered, the vacuum system requires the highest capital investment and the highest amount of annual O&M expense borne by Citizens. A typical schematic of a vacuum system is presented on Figure 2.



Figure 2 Typical Schematic of a Vacuum Sewer System

Low Pressure Sewer Systems

Low pressure sewer systems (LPSS) are package systems designed by a technology provider. LPSS can service one or more homes, resulting in a variety of package system sizes. A LPSS package includes a basin, control valves, piping, control panel, level control device, pump, and electrical connection. The number and size of each system component are dictated by the application needs. LPSS packages are typically installed on the property of the home owner, adjacent to the home. The package system can be quickly connected to the existing sanitary piping upstream of the septic tank. Once a predefined volume of sanitary flow is received in the basin, pumping commences. Received flow is macerated prior to entering the pump by way of a cutter head affixed to the inlet of the pump. Flow is pumped through a lateral to a common discharge line, or pressure sewer, within the right-of-way, before being conveyed to the discharge point in the collection system.

The required pipe size for a low pressure system is often less than one half the diameter required for a similar gravity or vacuum system, with sizes as small as two inches being common. Low pressure system piping is often installed by way of horizontal directional drilling which minimizes surface disruption. As a result, capital cost savings result from minimizing restoration costs and disturbances to neighborhoods is minimized. Capital costs for LPSS include the LPSS packages and the associated residential appurtenances, low pressure laterals, and common force mains. O&M costs would be minimal to Citizens, as the home owner is responsible for the basin and associated appurtenances outside of the right-of-way upon completion of installation. Of the STEP technologies considered, LPSS require the least capital investment and the least amount of annual O&M expense borne by Citizens. A typical schematic of a LPSS is presented on Figure 3.

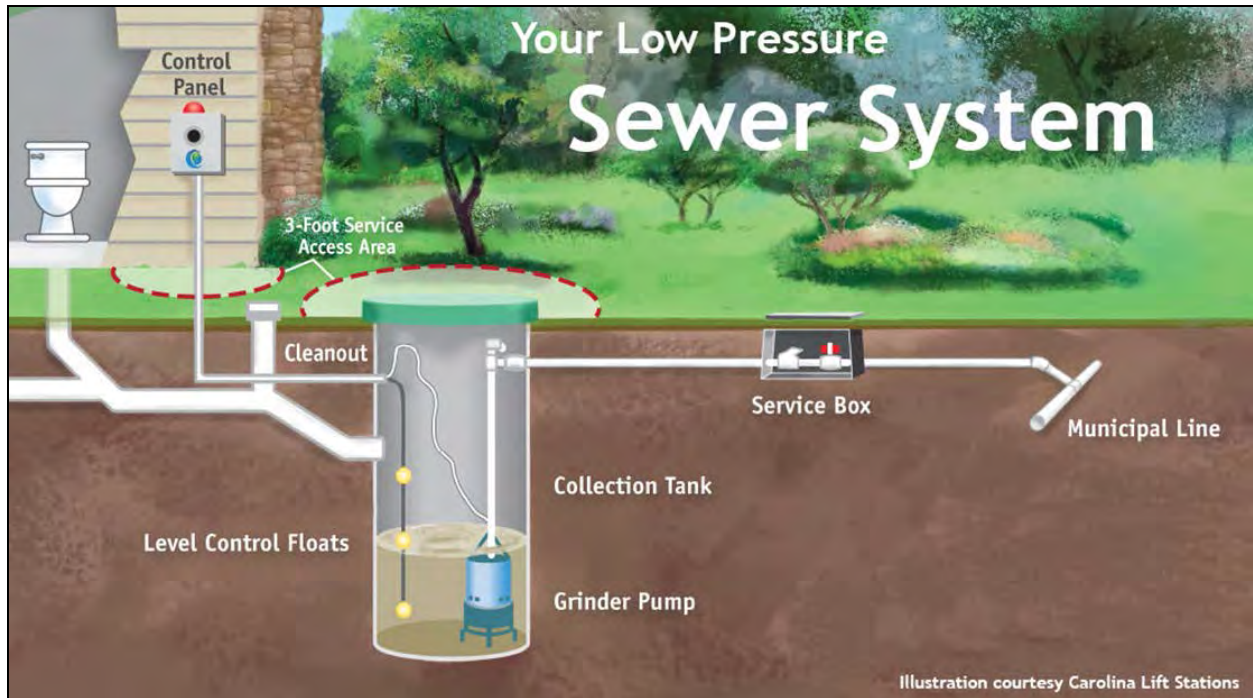


Figure 3 Typical Schematic of a Low Pressure Sewer System

RECOMMENDED STEP TECHNOLOGY

For the reasons presented herein, low pressure sewer systems (LPSS) are recommended for further consideration by Citizens for use in the Septic Tank Elimination Program (STEP). LPSS provide consistent, repeatable, and proven implementation as part of the STEP at the best value for Citizens and their customers. While gravity systems and vacuum systems are suitable for the elimination of septic tanks, they are not recommended for further analysis due to the high capital costs and O&M costs required, when compared to LPSS.

LOW PRESSURE SEWER SYSTEM COMPONENTS

Each LPSS package includes similar components, which include a basin, control valves, piping, control panel, level control device, and pump. An overview of the basic LPSS package components is as follows.

Basin

Sanitary flow is collected within the basin prior to being pumped into the pressure sewer system. The basin volume is dependent on the service application. Basins are generally constructed using either fiberglass reinforced plastic or high-density polyethylene. Both materials are capable of withstanding loads, pH ranges, and temperature ranges that are common for LPSS. All LPSS options considered hereafter provide a variety of basin sizes and materials to accommodate specific requirements. Based on this evaluation, basin size and material are not distinguishing factors for the recommendation of a LPSS system.

Control Valves

Control valves regulate the interaction of each low pressure sewer station with the overall sanitary piping system. Shut off valves allow for system isolation in situations where maintenance is required. Check valves prevent backflow from the pressure sewer to basin, preventing basement backups. Valves used in LPSS are constructed of materials such as stainless steel, cast iron, bronze, brass, polypropylene, and PVC. All systems have similar valves using comparable valve materials. Based on this evaluation, control valves are not a distinguishing factor for the recommendation of a LPSS system.

Basin Piping

Basin piping associated with LPSS is typically PVC and HDPE. All LPSS have pre-configured piping within the basin with influent and effluent connections to be made through the basin walls. Based on this evaluation, basin piping is not a distinguishing factor for the recommendation of a LPSS system.

Control Panel

A NEMA 4x electrical control panel allows the LPSS to work properly and notify the owner should normal operations be compromised. System power is connected to the control panel from the homeowner's service line. Pumps may be operated manually from the control panel. If a system failure occurs, an audible alarm and warning light are activated. All of the LPSS options discussed hereafter provide control panels that are suitable for wall or post mounting. Backup power and mobile alert capabilities are also available.

LPSS control panels are customizable to user-specific preferences. Based on this evaluation, control panels are not a distinguishing factor for the recommendation of a LPSS system.

Level Control

The level control mechanism in a LPSS controls pump on-off operations. Malfunctions in level control can lead to basin overflows, odor issues due to stagnant sewage, and excessive pump start-stops, which can reduce the expected lifespan of the pump. Two level control device styles are typical for most LPSS systems on the market: mechanical floats and non-contact pressure switches.

Mechanical float switches open or close an electrical circuit within the LPSS based on the float switch position within the basin. When the water level is above the normal position of the float, an electrical circuit in the level control logic closes, resulting in a “pump on” operation. As the water level recedes and the float drops, the electrical circuit in the level control logic opens, resulting in a “pump off” operation. Common maintenance requirements associated with mechanical floats includes removal of grease and similar sanitary material from the floats and repositioning the float location within the basin.

Non-contact pressure switches determine the liquid level within the basin based on pressure. These switches are separated from the liquid environment, minimizing common level control mechanism maintenance issues. Non-contact pressure switches have few or no moving parts. Pressure sensors that have factory preset operating levels eliminate the need for onsite adjustments. Non-contact pressure switches have few maintenance issues.

Mechanical float switches work properly in LPSS; however, minor maintenance may be required. Non-contact pressure switches are nominally more expensive (\$50 to \$100) than mechanical float switches; however, they require less maintenance. Based on this evaluation, non-contact pressure switches are recommended, as the increased reliability and reduced maintenance outweigh the nominal price increase.

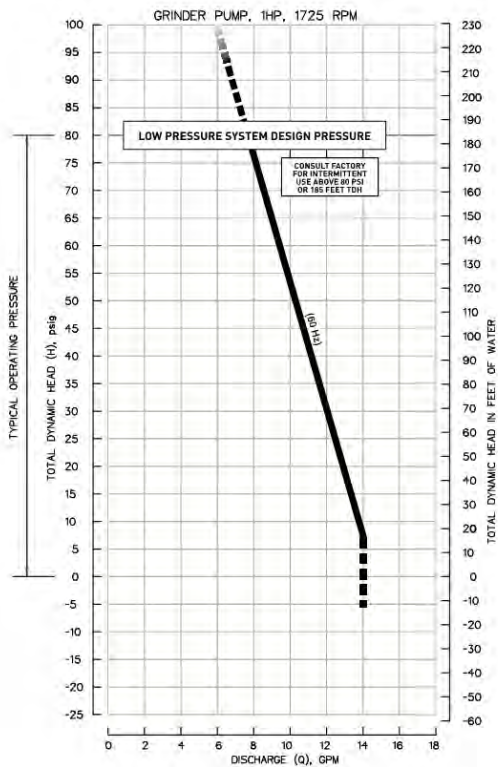
Pump

While many of the components of LPSS are similar, a major difference is the pump type. Two main LPSS pump types are prevalent and are installed with similar frequency: progressive cavity pumps and centrifugal pumps.

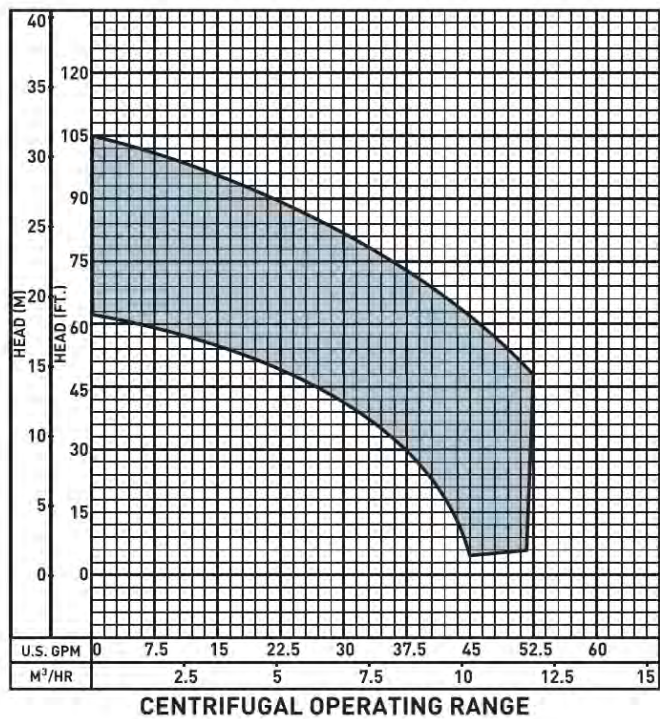
Progressive cavity pumps are a type of positive displacement pump where discrete cavities progress flow through the pump, resulting in a nearly vertical pump curve. Progressive cavity pumps allow for relatively constant flow delivery to the pressure sewer regardless of the head imposed on the system by adjacent pump operation.

Centrifugal pumps are a type of kinetic energy pump that utilize a rotating impeller to impart energy on the fluid within the pump volute. Centrifugal pump curves vary based on pump geometry. For LPSS, centrifugal pump curves are relatively flat, resulting in variations in flow given mild changes in head conditions.

Typical progressive cavity pump and centrifugal pump curves are presented on Figure 4 for comparison.



(Courtesy of E/One)



(Courtesy of Hydromatic)

Figure 4 Typical Progressive Cavity (Left) and Typical Centrifugal Pump Curves (Right)

The shape of the pump curves helps characterize how adjacent LPSS operate. As additional pumping systems operate in series, the flow of the pressure sewer would increase, often times resulting in an increase in system pressure or total dynamic head. An increase in total dynamic head can result in slight reduction of flow capacity for progressive cavity pumps and a large reduction for centrifugal pumps. If operating conditions become such that the head capabilities of one pump are exceeded, the smaller pump would stop pumping though the pump motor would continue to operate. This could result in additional wear imposed on the smaller pump and could lead to basin overflows and or pump failure.

Consequently, care must be taken when designing LPSS to minimize adverse interactions of multiple pumps. In general, different pump types should not discharge into the same pressure sewer, and the installation of new pumps within an existing system should be designed to ensure the pumps have similar head performance characteristic as adjacent, existing pumps. The additional care will mitigate premature pump failure and similar concerns noted above.

TECHNICAL COMPARISON OF LPSS PUMP MODELS

Pump model selection is based on the pump models available from the manufacturers that are most active in the Indiana LPSS market, which are Environment One, Flygt, Hydromatic, and Barnes.

Many of the basic components of LPSS provided by these manufacturers are similar and are not considered distinguishing factors. The most distinguishing characteristic of a LPSS package is the pump type, whose final selection is dependent on the hydraulic requirements of the system and the LPSS manufacturer performance history.

A technical comparison summary of the applicable pump models is presented in Table 1. Technical data sheets for Environment One, Flygt, Hydromatic, and Barnes are included in Appendices A, B, C, and D, respectively.

| Table 1 Low Pressure Sewer System Technical Comparison ¹ | | | | | | | | | | | | | | |
|--|---------------|--------------------|------------|-----------------|------------------|-----------------|------------------------------------|---|-----------------------------|-------------------------------|---------------------------|------------------------------|----------------------------|---|
| Manufacturer | Package Model | Pump Type | Pump Model | Horsepower (hp) | Flow Range (gpm) | Head Range (ft) | Years of Experience in LPSS Market | Local and Regional Installations | Standard Float Type | Level Control Device Location | Check Valve Material Type | Shutoff Valve Material Type | Location of Pump Servicing | Additional Special Provisions (if applicable) |
| Environment One | DH071 | Progressive Cavity | Extreme | 1 | 8 to 14 | 0 to 185 | 40 | Indiana: 14,658 Regional: 22,907 | Non-contact Pressure Switch | Within Pump | Stainless Steel | Stainless Steel | Onsite or Offsite | Suitable for installation in floodway or floodplain |
| Flygt | Compit 460 | Progressive Cavity | 3068.175 | 1.7 | 7 to 15 | 20 to 200 | 4 | Indiana ⁵ : Few Regional: Unknown | Mechanical Float Switches | Hanging | Stainless Steel | Stainless Steel ⁷ | Offsite | |
| Hydromatic | TG-Pro | Progressive Cavity | HPD200 | 2 | 8.9 to 19 | 20 to 175 | 36 | Indiana ⁶ : 15,000-20,000 Regional: Unavailable | Mechanical Float Switches | Hanging | Cast Iron | Brass | Offsite | |
| Hydromatic | TL-Pro | Centrifugal | HPG200 | 2 | 0 to 63 | 12 to 100 | 36 | | Mechanical Float Switches | Hanging | Cast Iron | Brass | Offsite | |
| Barnes | 30120SSRS | Centrifugal | OGP | 2 | 0 to 29 | 0 to 200 | 20 | Indiana: 10,000-20,000 Regional: Unavailable | Non-contact Pressure Switch | Fixed to Wall | Cast Iron | PVC | Onsite or Offsite | Fitted with the patented <i>Exclusive Slicerator</i> ™, which claims to eliminate jams and result in double the grinder blade life. |

Notes:

- Information presented within the table was collected through reviews of published information and discussions with manufacturers' representatives.
- All systems include a NEMA 4X control panel with an alarm light and audible alarm.
- Standard system components are listed within the table. Each LPSS is customizable to meet the specific requirements of the application.
- All pump models listed herein may be operated adjacent to a competitor's units assuming the hydraulic characteristics of the system are similar.
- Flygt entered the LPSS market in 2013 and has few installations in Indiana. A precise number is unavailable.
- Hydromatic does not have a firm record of the number of installations within Indiana. The range presented in the table was provided as a rough approximation by the Hydromatic representative. Hydromatic representatives noted that most of LPSS installations are single units, with the largest concentration of units being approximately 100 units in the City of Lawrence, Indiana.
- The shutoff valve material type was unavailable and determined by review of online manufacturer literature.

As the data in Table 1 suggests, all systems under consideration are suitable for LPSS service. While the flow ranges presented in the table are within the typical range for residential LPSS, the head performance is a differentiating factor. Hydromatic (TL-Pro Series, centrifugal pump) and Flygt (Compit 460, centrifugal pump) perform at head ranges up to approximately 110 feet. The other systems reviewed can operate at over 150 percent of this head range. If system head conditions could routinely be higher than 110 feet, then the Hydromatic (TL-Pro Series, centrifugal) and the Flygt (Compit 460, centrifugal pump) models should be removed from consideration.

The number of years a manufacturer has been in the LPSS industry is also an important factor of consideration. Flygt entered the LPSS market in approximately 2013. While Flygt has a long history of pump performance, Flygt does not have the same history with LPSS.

OPERATION AND MAINTENANCE COMPARISON OF LPSS PUMP MODELS

A comparison of capital investment and key O&M data from the evaluation of the pump models from the four manufacturers is presented in Table 2.

| Table 2 Low Pressure Sewer System O&M Review ¹ | | | | | | | | |
|--|--|--------------------------------------|---------------------------|--|------------------------------|--------------------------------|--------------------------|---|
| Manufacturer | Model No. | Manufacturers' Representative | Capital Cost ² | System Maintenance Cost ^{3,4} | Warranty Period ⁵ | Warranty Coverage ⁵ | Service Performance Plan | Service Provider Location |
| Environment One | DH071 | Covalen | \$2,900 to \$3,800 | Minimal | 2 years | Parts & Labor | Yes | Indianapolis, IN Covalen Service Center |
| Flygt | Compit 460 | B.L. Anderson | \$3,144 to \$3,927 | Minimal | 2 year | Parts & Labor | No | Indianapolis, IN Flygt Service Center |
| Hydromatic | HPD200 HPG200 | BBC Pump & Equipment Company, Inc. | \$2,500 to \$3,900 | Minimal | 1 year | Parts | No | Indianapolis, IN BBC Pump & Equipment Service Center |
| Barnes | UltraGrind Simplex Station Model 30120SSRS | American Pump Repair & Service, Inc. | \$2,500 to \$3,300 | Minimal | 2 years | Parts | No | New Palestine, IN American Pump Repair & Service, Inc. Service Center |

Notes:

- Information presented within the table was collected through desk-top reviews of published information and discussions with manufacturers' representatives.
- During discussions with the manufacturers listed, there were considerable variations in the price of the per package system. All manufacturers' representatives stated that per unit price presented can become more competitive based on the quantity of units purchased. The average package price for bulk orders that was provided by each vendor is presented in the table. The price cited for E/One is from a recent Citizens' purchase order.
- System maintenance costs are the likely costs incurred by Citizens through operation and maintenance of the low pressure system, including all infrastructure located within the right of way. With proper installation, the maintenance cost over a 20-year period is considered minimal.
- The operation and maintenance costs for all systems presented is expected to range from \$120 to \$240 per year, as presented in the Water Environment Research Federation (WERF) Collection Fact Sheet CS included in Appendix E. The anticipated life of all systems is 20 years, with pump rebuilds ranging from \$1,200 to \$2,400, per the cited WERF fact sheet.
- Warranty periods and coverage were noted as highly variable, dependent on the customer need and the quantity of units purchased. The cited durations and coverage are based on manufacturer published data. It is likely that comparable warranties can be negotiated with all manufacturers based on the quality of units purchased.

Representatives of each manufacturer noted extensive variability with the system service offering for the products they represent. This implies an intensely competitive market for LPSS. Warranty durations were noted as highly negotiable by multiple manufacturer representatives, with standard warranties starting at one year. A service performance plan was unique to Covalen, representatives of E/One, and has been included in Appendix A. This service performance plan was a negotiated item on previous Citizens STEP projects. All systems reviewed have local system servicing facilities.

PEER REVIEW OF LPSS PUMP MODELS

A peer review summary of the LPSS manufacturers and the associated pump models is presented in Table 3. Utility contacts were provided by each manufacturer.

| Table 3 Low Pressure Sewer System Utility Review ¹ | | | | | | |
|--|------------------------------------|--|------------------------|---|-------------------------------------|---|
| Manufacturer | Utility | Contact | No. of Installed Units | Earliest Unit | Recommend Manufacturer | Notes |
| Environment One | Twin Lakes Regional Sewer District | Mike Darter T: (574) 583 – 5649 District Manager | 5,100 | 1999 | Yes, E/One | <ul style="list-style-type: none"> • Extensive experience with E/One (2000 Series and Extreme Series) • Limited experience with other manufacturers. • Own and maintain all LPSS units within system. • Recommends use of stainless steel curb stop assembly over the standard plastic assembly to eliminate sanitary sewer overflow issues. • Very positive experiences with E/One systems and local representatives. |
| Flygt | Town of Owasco, New York | Bob Bruno T: (315) 729 – 5031 Sewer Department Manager | 190 | 2014 - Flygt 1999 - E/One | Yes, Flygt | <ul style="list-style-type: none"> • The first three years of Flygt LPSS system (Compit 460 PC pump) experience has been very positive. • Older E/One systems (2000 series) are only recently requiring replacement after approximately 18 years of use. • Challenges with new E/One units (Extreme series) related to the premature pressure switch failure. • No experience with Barnes or Hydromatic systems. • Flygt provided a 5 year “unlimited” warranty to the Town of Owasco. |
| Hydromatic | City of Lawrence, Indiana | Greg Gee T: (317) 501 – 7808 Collection System Supervisor | 94 | 1970 – Hydromatic (Cent) 2007 – E/One (PC) 2015 – Hydromatic (PC) | Yes, Hydromatic | <ul style="list-style-type: none"> • Extensive experience with Hydromatic and E/One. • A competitive offer around the time the Hydromatic units reached the end of usable life (2007) resulted in a complete shift to E/One (Extreme series). • E/One (2000 series; Older model) performed very well. • New E/One model (Extreme series) underperformed and resulted in a process of complete replacement with Hydromatic HPD (progressive cavity pump) starting in 2015. • Noted very positive experiences with local representative of Hydromatic for pump needs. |
| Barnes | Lakeland Regional Sewer District | Dan Fox T: (317) 440 - 9615 Astbury Group Operator of System | 1,900 | 2009, See notes. | Yes to both Barnes and E/One. | <ul style="list-style-type: none"> • Estimated some of the first Barnes and E/One systems were installed at Lakeland Regional Sewer District around 2009, though they could have been installed earlier. • Barnes systems outperform E/One systems in applications where grit could be a concern. Grit erodes the E/One stator (progressive cavity pump). The Barnes system is a centrifugal pump and is not as quickly impacted by grit. • If higher than typical LPSS flows are needed for commercial LPSS applications, then Barnes centrifugal pumps are preferred over E/One systems strictly on the basis of pump discharge flow rates. • Extensive experience with both Barnes and E/One systems. Both are good systems for residential LPSS. • Do not recommend Hydromatic based on Lakeland Regional Sewer District experiences. • No Experience with Flygt. |

RECOMMENDATION

As evident throughout this memorandum, each of the LPSS packages evaluated could be a viable alternative for Citizens' Septic Tank Elimination Program. While the E/One system has been the system of choice on past STEP projects, the emergence of competing systems and advances in their technologies warrant revisiting this approach. As such, Black & Veatch recommends a competitive sourcing event for LPSS package systems as part of Citizens' ongoing value engineering and continuous improvement initiative.

APPENDIX A
Environment One Product Data

**ENGINEERED
TO DO ONE JOB
PERFECTLY**

E/ONE
EXTREME
S E R I E S

**PRESSURE
SEWER
SYSTEMS**

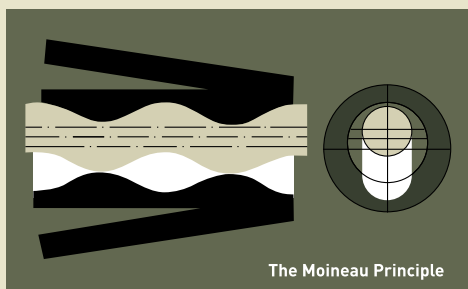


ENGINEERED TO DO ONE JOB PERFECTLY

At the heart of the E/One Sewer System is the toughest, hardest working pump in the industry. The new standard in excellence, durability, and longevity, the E/One Extreme Series Grinder Pump. Its evolution reflects everything we've learned in 40 years as the originator and leader in the category of low pressure sewer systems.

The pump stations incorporate the grinder pump, motor controls and level sensing device integrated into a compact unit, easily removable for servicing when necessary.

And, the geometry of the pump not only produces a near-vertical pump curve, but allows passage of ground solids without clogging. Because of the low rpm and highest quality components, we experience the lowest service call rate in the industry. An average mean time of 10 years between service calls is typical.



The progressing cavity pump itself is based on the Moineau principle. A rotor turns within a stator, creating a sequence of sealed chambers. The precision-cast and polished stainless steel rotor moves wastewater through these chambers at a nearly constant flow, over a wide range of conditions – from negative to abnormally high heads. Turning at just 1,725 rpm, the one-horsepower motor can pump fluid through more than two miles of small-diameter piping or elevation changes of over 185 feet.

SOME KEY ADVANTAGES:

- **HIGH HEADS/NEGATIVE HEADS.** Reliable operation from negative head to 185 feet of total head for continuous duty reduces the number of lift stations and pipe sizes. This cuts costs – both initially and in long-term operation and maintenance.
- **CONSTANT FLOW.** The system pressures to be overcome by any given grinder pump in a low pressure system vary dramatically over the course of a day. E/One's progressing cavity pump readily accommodates these pressure variations while maintaining a nearly constant flow without ever operating at "near shut off" – thus avoiding the wear and motor burn-out suffered by other pump types.
- **HIGH GRINDING TORQUE.** Our unique pump system, driven by a one-horsepower motor turning at 1725 rpm, produces grinding torque greater than a two-horsepower pump turning at twice the speed.
- **ENERGY EFFICIENT.** The pump is activated automatically and runs for short periods. Typical annual energy consumption is comparable to a 40-watt light bulb.
- **LOW MAINTENANCE SUBMERSIBLE MOTOR.** Low maintenance and long life are the hallmarks of our air-filled motor. Permanently lubricated ball bearings and Class F insulation eliminate the need for periodic oil changes and oil disposal costs required by oil-filled submersible motors.
- **LARGE-DIAMETER GRINDER ASSEMBLY.** Almost twice the diameter of most other types of grinder pumps, contributing to a dramatic reduction of inflow velocity for less wear and no blinding, clogging or jamming.
- **NO PREVENTIVE MAINTENANCE.** Non-fouling static level sensors require no preventive maintenance. Because of our unique, near constant discharge rate, no main line flushing is required in a properly designed system.
- **CORROSION RESISTANCE.** E/One's stainless steel ball-type discharge valve and piping won't corrode like copper or galvanized, and hold up years longer. No corrosion, no maintenance.
- **DEPENDABILITY.** E/One pumps typically run ten years between service calls with 40 years of in-ground experience.
- **PROVIDES FOR ENVIRONMENTALLY SOUND WASTEWATER MANAGEMENT.** The E/One Extreme Series grinds waste material into small particles. This enables the use of inexpensive, small-diameter pressure pipes, buried at shallow depths, to transport wastewater to a suitable processing site. Result: Ground water contamination from failing septic tanks can be eliminated.
- **SERVICEABILITY.** Our unique core design eliminates the need for in-field troubleshooting and pump servicing. This means lower maintenance costs and minimum homeowner inconvenience.

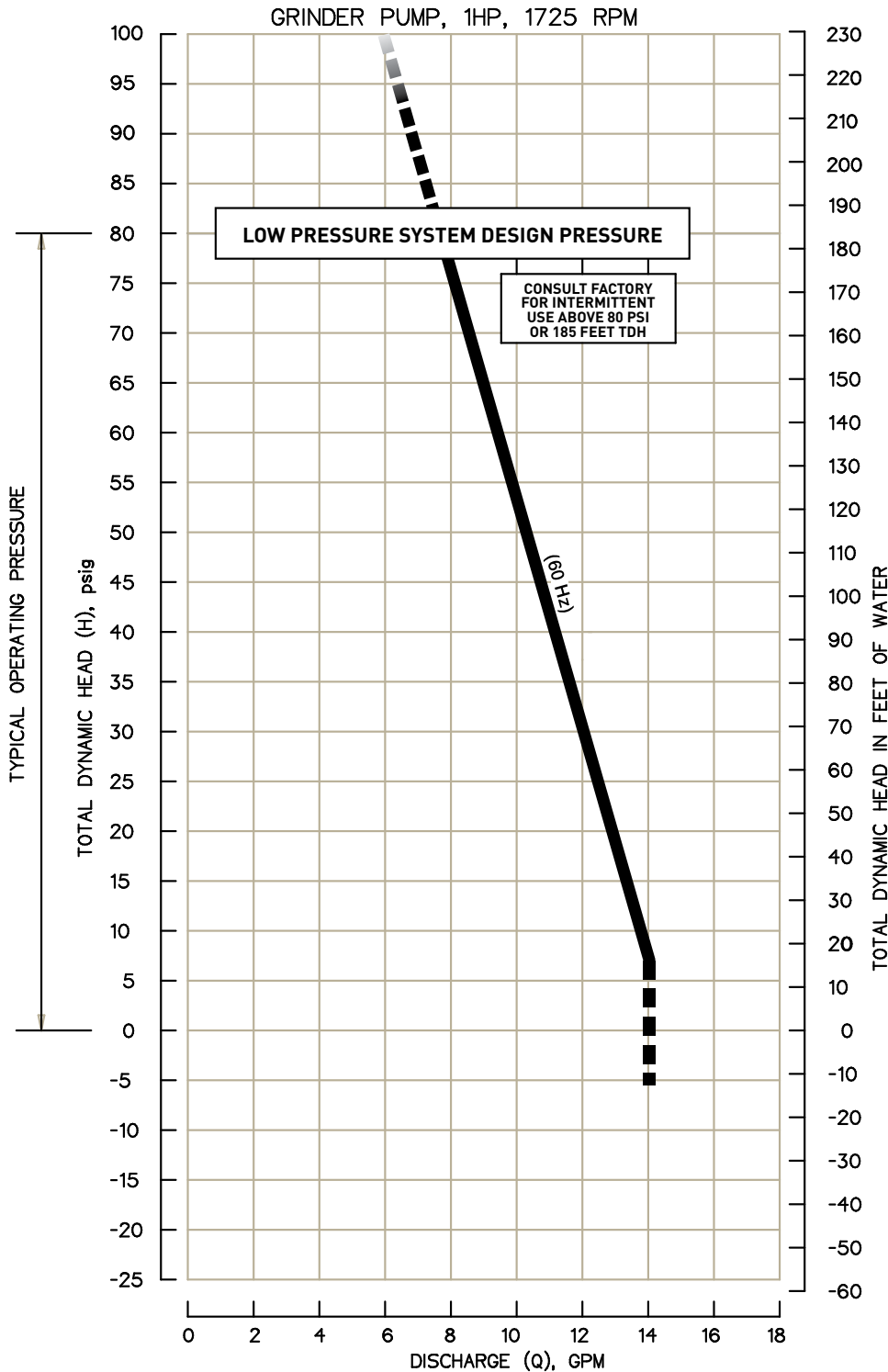
GRAVITY SEWERS ARE NO LONGER THE RULE FOR SOLVING WASTEWATER PROBLEMS.

At the heart of the system is the E/One progressing cavity grinder pump – with high heads that can eliminate costly lift stations, and a robust, powerful design that translates into the industry’s highest levels of reliability, availability and maintainability.

ENGINEERED LOW PRESSURE SYSTEMS

REPEALING THE LAW OF GRAVITY

E/ONE SPD PUMP PERFORMANCE CURVE



NOBODY CAN TOUCH OUR CURVE.

In a low pressure system, constant, predictable pump output is the foundation for proper hydraulic design. It enables the engineer to minimize retention time, pump wear, and keep scouring action at effective levels.

Environment One’s semi-positive displacement, progressing cavity pump has a nearly vertical H-Q curve. It is by far the most “forgiving” pump design – providing predictable flow over the full range of typical system pressures; strengths critical in a large-scale, low pressure sewer.

E/One’s superior high head capability allows a system with few, if any, lift stations. And, it easily accommodates additional future connections without compromising system performance.

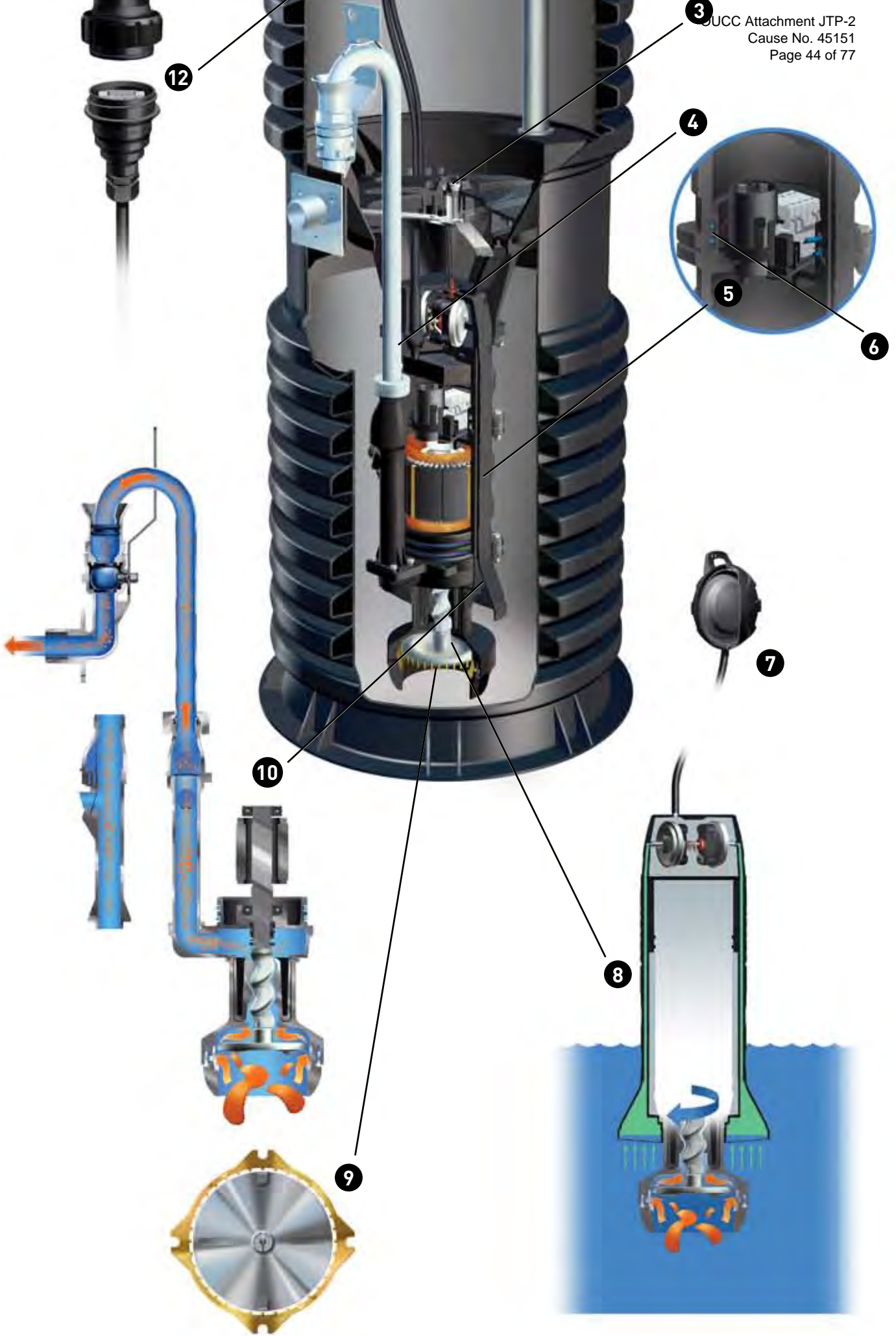
These E/One pump characteristics translate into:

- predictable hydraulic design
- lower collection system capital costs
- less maintenance
- lower operating costs

ANATOMY OF A LEADER: THE INSIDE STORY ON THE E/ONE GRINDER PUMP STATION.

- 1 LOW-PROFILE COVER:** Aesthetically pleasing. Provides easy access for service while blending with surroundings.
- 2 HIGH-DENSITY POLYETHYLENE TANK:** Double-wall construction of high-density thermoplastic for rugged reliability. Factory pressure tested for infiltration and exfiltration free installation.
- 3 QUICK-RELEASE CORE LATCH:** All stainless mechanism secures core in place and can be easily released from ground level.
- 4 STAINLESS STEEL PIPING & HARDWARE:** E/One's SS discharge piping and ball valve won't corrode. No corrosion, no maintenance, no tools required.
- 5 UNIQUE CORE DESIGN:** Eliminates the need for in-field troubleshooting and service. Modular controls simplify service.
- 6 DOUBLE O-RING SEALS:** Make assemblies waterproof and novel joint geometry minimizes the effects of crevice corrosion.
- 7 E/ONE EQUALIZER:** Compensates for fluctuations in atmospheric pressure to enable accurate level sensing while assuring the level sensing system is watertight.
- 8 PROGRESSING CAVITY PUMP:** A deceptively simple design produces a nearly constant flow under a wide range of continuously varying conditions.
- 9 GRINDER WHEEL AND SHREDDER RING:** Hardened corrosion-resistant cutter bars and teeth process sewage, grinding wastewater solids, as well as wood, plastic and cloth. Will not jam or clog!
- 10 PRESSURE SWITCH LEVEL CONTROL:** Self-cleaning level sensors require no preventive maintenance.
- 11 DIRECT-BURY CABLE:** For simple and inexpensive installation.
- 12 ELECTRICAL QUICK DISCONNECT:** For safe and easy service. UL-listed, compatible with OSHA regulations for confined space entry.





LEADING THE INDUSTRY WE INVENTED.

Environment One not only pioneered the low pressure sewer system, but consistently leads the industry both in system deployment and innovation. The company is dedicated to Total Quality, Continuous Improvement, and Customer Satisfaction, as evidenced by the E/One Extreme Series. Today, there are nearly a million end users worldwide.

SEWER ANYWHERE

Driven by the remarkable E/One Extreme grinder pump, E/One Sewers give engineers, developers, municipal sanitarians, and land planners unprecedented new freedom in land usage and septic tank replacement.

With a smaller footprint and a softer touch on the land, they're so much easier to install. Front-end costs can be reduced by as much as 80%. Total installed costs by half. And O&M costs by up to 75%.

The E/One Extreme grinder pump reduces all forms of sanitary waste to a non-clogging slurry and pumps it through a network of small-diameter pipes. Since gravity is replaced by the power of the pump, sewer systems need not run downhill nor require large-diameter pipes, deep trenches, multiple booster stations – or their associated costs.

A system powered by the E/One Extreme grinder pump converts formerly cost-prohibitive building sites into cost-effective reality. "Problem areas," with high ground water, elevation changes or impenetrable bedrock, are transformed into valuable, developable real estate.

Of course, E/One's low upfront cost advances apply to conventional building sites as well.

In addition, E/One units are easy to install and virtually maintenance-free – refined through 40 years of experience with the largest installed base in the industry.



SAVE THOUSANDS, VIRTUALLY SERVICE-FREE.

Contact your local distributor:



SEWER SYSTEMS

Environment One Corporation
2773 Balltown Road
Niskayuna, NY USA 12309-1090
Voice (01) 518.346.6161
Fax 518.346.6188
www.eone.com

A Precision Castparts Company
LM000364 Rev B



Welcome to the Covalen and E/One Sewer System Family!

We are confident that with proper care, you will get years of reliable service from your new E/One Sewer System Package.

Covalen Service Group is pleased to provide our Service Performance Plan for all Citizens Energy Group STEP customers.

Service Performance Plan

As part of our Service Performance Plan (\$216/year ACH @ \$18.00 / month) you will receive:

Annual equipment 8-point inspection and diagnostic check of grinder pump

- ✔ Visually inspect alarm/disconnect panel for damage or water intrusion
- ✔ Tighten all internal wiring and inspect all terminals for abnormal conditions
- ✔ Visually inspect grinder pump lid and protective shroud for damage or water intrusion
- ✔ Open station lid and inspect dry access way for water intrusion, and debris
- ✔ Check and test pump electrical connection in access way
- ✔ Operate pump and test for:
 - Correct voltage
 - Proper operating amperage
 - Proper on/off operation of level controls
 - Proper alarm operation, both visual and audible functions
 - Proper pump performance measured in Gallons Per Minute (GPM)
- ✔ Visually inspect internal pump discharge point for leakage
- ✔ Verify all internal wiring, pump extraction device and specialty controls are in their proper orientation and securely in place.

Upon completion of inspection, Covalen will provide written report on station operation and any recommendations for service/repair/site conditions that were found to be needed.

Upgrade to an E/One Sentry Advisor custom alarm panel and get monthly monitoring for only \$120 per year or \$10 per month as part of your Service Performance Plan!

COVALEN Service Group is proud of our tradition of providing excellent service to homeowners in Indianapolis and the surrounding areas. We will continue to build long-lasting relationships with our customers through our winning spirit and commitment to **100% satisfaction, guaranteed!**

We understand the importance of having a trusting relationship with technicians that come to your home. We offer you peace of mind, ensuring your equipment runs safely and the job is always done right. Our attention to detail and personal approach to every job sets us apart from our competitors. We have always based our business principles on fast response, guaranteed parts and labor, assured comfort and complete customer satisfaction.

COVALEN Service Group understands your time is valuable and we never keep you waiting. We provide you with a knowledgeable team of factory trained specialists who have the proven professional experience to do any job right the first time. You can count on our courteous technicians to provide you with **exceptional service 24/7.**

COVALEN Service Group provides optional products and services to enhance your installation: decorative cover, service performance program, and remote monitoring. Please contact us to learn more.



6923 Brookville Rd · Indianapolis IN · (317) 789-8888
www.covalen.com/step

See e/one owner's guide for manufacturers warranty and further details.

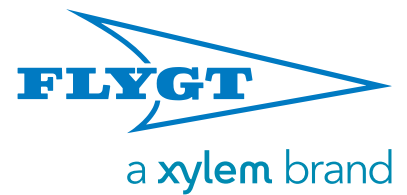
For any non-warranty parts, **save 10%!**

APPENDIX B
Flygt Compit 460 Product Data



Compit Pressure Sewer System

WITH PROGRESSIVE CAVITY OR CENTRIFUGAL GRINDER PUMPS



Does “One Size Fits All” Fit Your Design Requirements?

With more than 300,000 grinder pumps in successful service since the early 1980s, Flygt understands the importance of pump selection in the overall performance of your pressure sewer system. That’s why Flygt Compit Pressure Sewer Systems offer two proven grinder pump technologies to better meet your specific needs—progressive cavity or centrifugal hydraulics. By matching the right technology to your system demands, we can improve performance efficiency and lower energy consumption and annual operating costs.

Flygt Progressive Cavity Pump

- The Flygt centrifugal grinder pump family includes the same pumps used in municipal and commercial pump stations since the early 1980’s
- Predictable performance with flow ranging from 6-15 gallons per minute for most system designs
- Exclusive double-row lower bearing and wear sleeve provide increased shaft stabilization and longer motor and seal life
- Exclusive seal cavity design comprised of two independent mechanical seals that run in a food-grade oil bath, eliminating foreign-debris damage and delivering longer run times between service
- Trickle-impregnated method of insulating motor windings results in 80-90% fill rate and eliminates air pockets, allowing the motor to run at a lower temperature for extended motor life



Flygt Centrifugal Grinder Pumps

- Rugged, municipal-designed pump with a higher head capacity and more flow at run-out
- Wide range of performance with flows over 200 gallons per minute
- Based on a flexible modular design all sizes have the same discharge size and several interchangeable impellers to meet today’s demands and tomorrow’s growth
- Exclusive seal cavity design comprised of two independent mechanical seals, one running in a food grade oil bath and the other running in the pump media with spin out that eliminates foreign-debris damage and enabling longer run times between service
- Trickle-impregnated method of insulating motor windings results in 80-90% fill rate and eliminates air pockets, allowing the motor to run at a lower temperature for extended motor life





1 Compit 460/570 Small Residential and Commercial Applications

- Total storage capacity from 120 to 150 gallons
- The Compit 570 was designed for northern climates where the discharge needs to be below the frost line which can be over 4 ft.
- Both the 460 and 570 basins are easy to install, with eight flat panels for easy-to-locate station penetrations
- Compatible pumps: M3000 Series centrifugal and 3068.175 progressive cavity pumps



2 Compit 900 Large Residential and Small Commercial Applications

- A simplex station design with total storage capacity near 240 gallons and heights ranging from 74" to 118" with extension
- Cover materials include polyethylene, or concrete for traffic-rated applications
- Easy to install with two bosses for electrical or venting and a single predetermined inlet boss
- Large bottom flange eliminates the need for concrete ballasting, lowering install time and cost
- The bottom is bowl shaped to promote solids removal and reduce resting volume
- Compatible pump: 3068.175 progressive cavity



3 Compit 2000/2500 Hotels, Multiple Homes, Commercial and Smaller Municipal Station Applications

- Total storage capacity from 500 to 625 gallons
- Practical basin design saves valuable installation time by allowing the inlet field to be installed anywhere between ribs
- The cover is screwed on and sealed with an adhesive gasket to keep odors confined to the station or vented to a remote location
- The bottom is hopper shaped to direct all solids down to the pump inlet, allowing easy removal before issues arise and reducing resting volume
- Compatible pumps: M3000 Series Centrifugal and 3068.175 progressive cavity

Reduce Running and Service Costs with Flygt Monitoring & Control Solutions

Maximize the efficiency of your Compit Pressure Sewer System with Flygt monitoring and controls. The Flygt control offer focuses on reducing downtime while making the system easy to operate, and providing the homeowner proven municipal grade technology for residential use.

Flygt FGC211 Intelligent Control

Advantages

- Motor protection with built-in overload protection and user-defined maximum motor current
- Maintenance runs will exercise for one second every four days to keep seals adequately lubricated
- Automatic reset from the FGC allows the end-user to enter the number of automatic restarts from 1-200. The counter clears after a successful restart
- Starting and power on delay to prevent an over-pressure situation, the FGC starts pumps with a delay of 1-120 seconds when starting the pumps after a power interruption



Flygt Phase Conversion Panel

Advantages

- Nearly double the starting torque and up to 30% energy savings when compared to single phase systems
- Additional motor protection will shut pump down in under or over voltage conditions
- Self starting system does not require start and run capacitors to run the pump
- Reduced operating cost and low stress on the motor due to reduced in rush starting current



Flygt is a brand of Xylem, whose 12,000 employees are addressing the most complex issues in the global water market.

Xylem, Inc.
14125 South Bridge Circle
Charlotte, NC 28273
Tel 704.409.9700
Fax 704.295.9080
855-XYL-H201 (855-995-4261)
www.xylem.com

www.xylemwatersolutions.com/scs/usa

APPENDIX C
Hydromatic Product Data



HYDROMATIC[®] SEWAGE GRINDER PUMPS AND PACKAGES

Submersible Grinder Pumps

2 HP Submersible Grinders

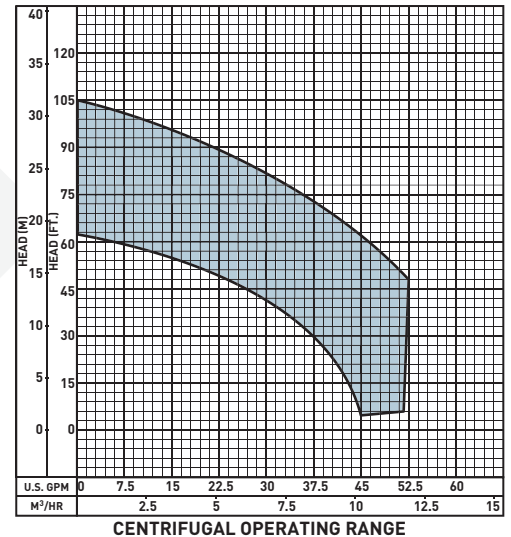


Hydromatic® 2 HP Grinder Pumps offer a proven method of reducing residential waste into a fine slurry for ideal transfer to a variety of sewage treatment operations. Our Centrifugal Grinders use an exclusive “dual cutter” design that prevents clogging, binding, and roping in a wide range of operating conditions. These cutters cut waste twice to reduce it to an even finer slurry. The first cut is performed by the radial cutter; the second by the axial cutter that “recuts” the waste in a perpendicular direction to the radial cutters. This creates even smaller particles, making for better sewage flow.

Our Semi-Positive Displacement Pumps are ideal for the high head conditions typically associated with low pressure sewer systems. We offer pumps that will dependably perform in Class I and Class II hazardous locations.

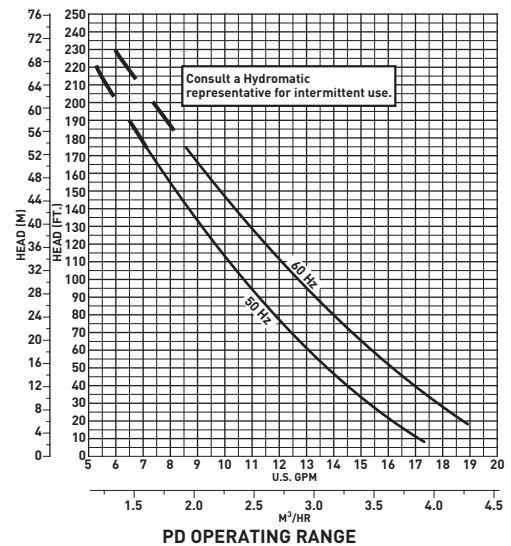
Hydromatic Centrifugal Grinders

Centrifugal Grinders offer a number of semiopen vortex impeller diameters to generate dependable performance over a wide range of flow and head conditions.



Hydromatic Semi-Positive Displacement Grinder

Semi-Positive Displacement Grinders feature a progressing cavity design with a Buna-N stator for extended durability in the high head conditions required by low pressure sewer systems.



Grinder Packages

Ready-To-Install 2 HP Grinder Packages

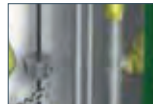
Hydromatic® 2 HP Grinder Packages provide the superior quality of Hydromatic grinder pumps combined with the highest quality fittings and controls, and a control panel specifically designed to optimize pump performance, all packaged together in a durable UV resistant basin for quick and easy installation.

TL-PRO SYSTEM

Liftout rail system for centrifugal grinders provides ease of installation and removal for the pump. The TL-Pro System uses a cast iron discharge elbow with integrated ball check valve and is available with spark-proof rails for hazardous locations.

Available with:

- HPGR200
- HPGX
- HPG200 (shown)
- HGRS200



TL-Pro liftout valve with integral ball check valve.



TG-PRO SYSTEM

Flexible piping system with slip-fit discharge connection provides ease of installation and removal for all 2 HP grinders. Pumps include a stainless steel stand.

Available with:

- HPD200 (shown)
- HPG200
- HPGR200
- HGRS200



Heavy-duty 1 1/4" flexible pipe and easy slip-fit connection allows for quick installations and servicing.



TH-PRO SYSTEM

Factory assembled discharge piping with single union ball valve disconnect eliminates installation errors and reduces installation time dramatically.

Available with:

- HPD200 (shown) and HPGR200



Ball valve with union disconnect allows easy removal of the pump and piping.



Innovative solid state control panel with hand-contact sensor to control the alarm functions and integrated alarm light and buzzer. The control panel includes on-board pumping system diagnostics with pump run time counter and pump cycle counter.

Optional Features:

- Available in depths from 4' to 8'
- Optional junction box

TL-Pro and TG-Pro

Using an exclusive control circuit board built to maximize the performance of Hydromatic 2 HP grinder pumps, the Novus 1000 Plus Series Control Panel is an integral part of the 2 HP Grinder Package. Standard features include lockable latches, subdoor, raised back panel, flashing red alarm light, electronic horn, and "touch-to-silence" pad in a NEMA 4X enclosure.

Standard Features and Benefits

- 24" fiberglass basin
- UV resistant basin and lid
- Brass shut-off valve
- Built-in anti-siphon protection
- NEMA 6 JBox
- Weighted float switches
- Slip-fit connection ball check valve
- Pressure-relief valve (HPD200 models only)



NOVUS
1000 PLUS SERIES

Optional Features and Benefits

- Fiberglass and steel lids for added strength
- Duplex system
- Fiberglass basin with diameters up to 72"
- Curb-stop assembly available

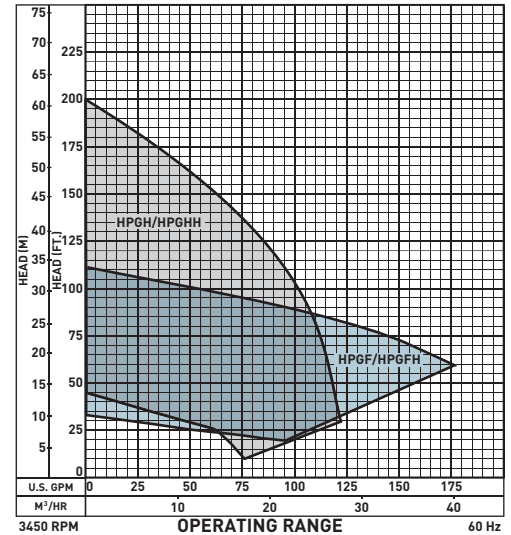
24" Fiberglass Depth Chart

| Depths | Available |
|---------|-----------|
| 5 feet | ✓ |
| 6 feet | ✓ |
| 7 feet | ✓ |
| 8 feet | ✓ |
| 9 feet | ✓ |
| 10 feet | ✓ |

Submersible Grinder Pumps

3 – 7.5 HP Submersible Grinders

When your waste removal needs exceed the capabilities of the residentially designed 2 HP submersible grinders, Hydromatic® offers a complete line of 3, 5 & 7.5 HP submersible grinder pumps for a variety of high flow (HPGF) and high head (HPGH) conditions. These pumps come with either a 2" NPT vertical or 3", 125 lb. horizontal flange for discharge. All Hydromatic centrifugal grinders use the exclusive dual cutter grinder system and have dual seals for added motor protection. We offer pumps that will dependably perform in Class I and Class II hazardous locations.



Model HPGH



Model HPGF



Model HPGHX/HPGHXX

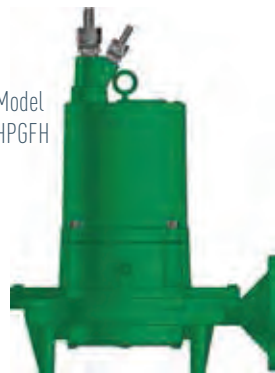
HPGHXX and HPGFHX models not shown.



Model HPGFX/HPGFHX



Model HPGFH



Model HPGHH



Grinder Packages and Non-Submersible Grinders

3 – 7.5 HP Grinder Packages

Hydromatic® 3–7.5 HP Grinder Packages combine the quality of Hydromatic grinder pumps with our exclusive Novus Series of control panels.

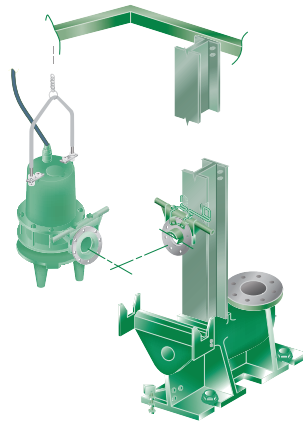
Available with a variety of material and NEMA-rating enclosures, Hydromatic Novus Series Control Panels use state-of-the-art digital controllers to optimize operation of your simplex, duplex, or triplex 3–7.5 HP submersible grinder system.



Novus 2000 Simplex Controller Unit Novus 2000 Duplex Controller Unit Novus 4000 Simplex, Duplex, or Triplex Controller Unit

PR Rail System

Noncorrosive lift-out rail system designed for horizontal discharge pumps (HPGFH/HPGHH) featuring a reliable connection/disconnection system including a diaphragm gasket for sealing to the discharge elbow. The system will accept 3" flow.

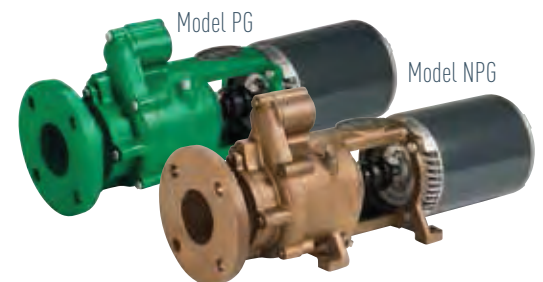
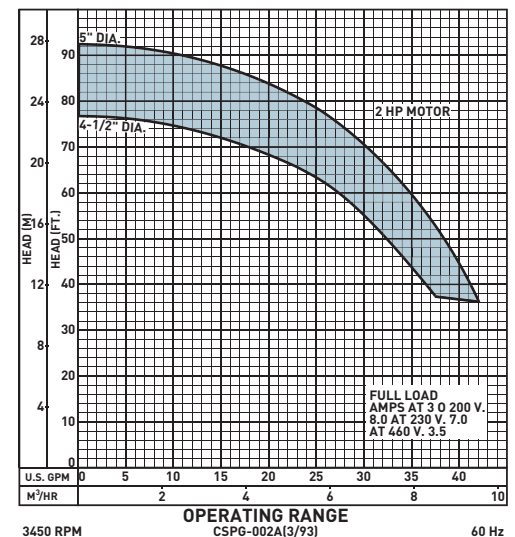


2 HP Non-Submersible Grinders

Hydromatic 2 HP non-submersible Grinder Pumps offer the same reliable service that comes with a submersible grinder pump. Our exclusive "Dual Cutters" reduce waste into a fine slurry for ideal transfer to a variety of sewage treatment applications. Available with either a cast iron or navy M bronze pump ends, these pumps provide the service you need when your application doesn't require a submersible pump.

Features and Benefits

- Dry-pit pump end, motor ordered separately
- Pump end oil-filled for heat dissipation and lubrication
- Cast iron pump end (PG only)
- Navy M bronze pump end designed for marine applications (NPG only)
- Flexible motor coupling
- 2 HP, 200/230V single phase, 200/230/460V three phase motor
- 60 Hz/50 Hz (3450 RPM/2900 RPM)
- Bronze semiopen impeller (4 1/2" to 5" diameter)
- Exclusive "dual cutter" reduces particle size
- 1 1/4" NPT discharge

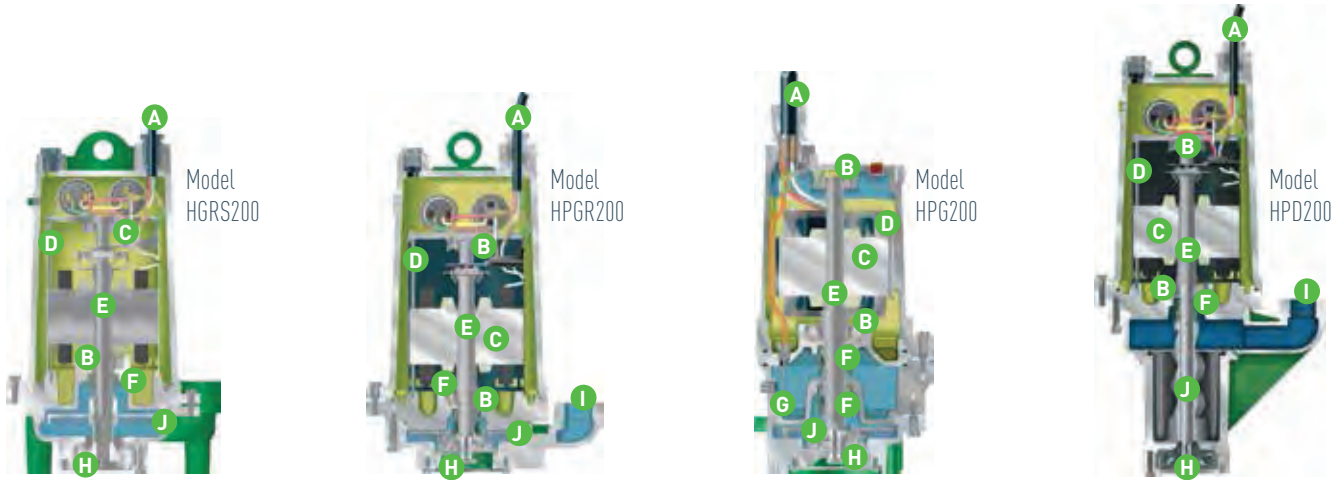


Pump Details

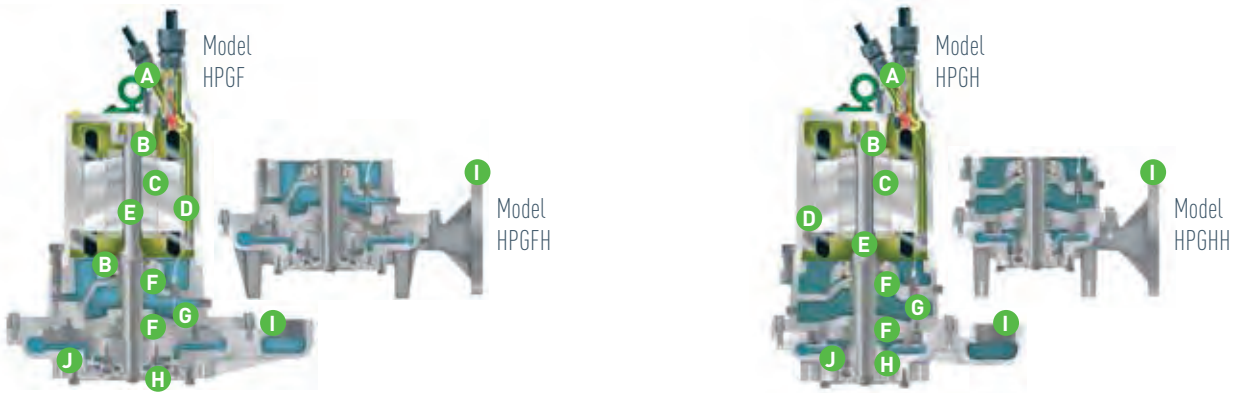
| Submersible Grinder Guide | | | | | | | | | | |
|---|---|-----------------------------------|--|--|--|---|---|--|---|---|
| | | Single Seal | | | Dual Seal | | | Hazardous Location | | |
| | | HGRS200 | HPGR200 | HPD200 | HPG200 | HPGH / HPGHH | HPGF / HPGFH | HPGX200 | HPGHX / HPGHHX | HPGFH / HPGFHX |
| A Cord Entry: Sealed for maximum protection from wicking and water seepage into the motor housing. | Compression Fitting | X | X | X | X | X | X | X | X | X |
| | Epoxy Barrier | | | | X | X | X | X | X | X |
| | O-Rings | | | | X | X | X | X | X | X |
| | Connection Box | | | | | | | | X | X |
| B Bearings: Heavy-duty ball bearings, upper (radial) and lower (thrust), are continuously lubricated by oil to ensure long service life. | | X | X | X | X | X | X | X | X | X |
| C Motor: Oil-filled motor provides superior cooling and permanent lubrication of bearings, low maintenance and extended service life. Electrical design combines the advantages of high torque output with optimum running efficiency engineered specifically for grinder operation. | Single Phase: Start capacitors for maximum starting torque. Motor windings contain automatic thermal overload protection. | 2 HP 230V 60 Hz 3450 RPM | 2 HP 230V 60 Hz/50 Hz 3450/2900 RPM | 2 HP 230V 60 Hz/50 Hz 1750/1460 RPM | 2 HP 200/230V 60 Hz/50 Hz 3450/2900 RPM | 3 & 5 HP 200/230V 60 Hz/50 Hz 3450/2900 RPM | 3 & 5 HP 200/230V 60 Hz/50 Hz 1750/1460 RPM | 2 HP 200/230V 60 Hz/50 Hz 3450/2900 RPM | 3 & 5 HP 200/230V 60 Hz/50 Hz 3450/2900 RPM | 3 & 5 HP 200/230V 60 Hz/50 Hz 1750/1460 RPM |
| | Three Phase | | | | 2 HP 200/230/460/575V 60 Hz/50 Hz 3450/2900 RPM | 3, 5, 7½ HP 200/230/460/575V 60 Hz/50 Hz 3450/2900 RPM | 3, 5, 7½ HP 200/230/460/575V 60 Hz/50 Hz 1750/1460 RPM | 2 HP 200/230/460/575V 60 Hz/50 Hz 3450/2900 RPM | 3, 5, 7½ HP 200/230/460/575V 60 Hz/50 Hz 3450/2900 RPM | 3, 5, 7½ HP 200/230/460/575V 60 Hz/50 Hz 1750/1460 RPM |
| D Stator Bolts: Stator is secured to the motor housing by means of stator bolts which ensures ease of maintenance if the need ever arises. | | X | X | X | X | X | X | X | X | X |
| E Shaft: Stainless steel shaft to eliminate corrosion and fatigue for longer pump life. Minimized shaft overhang decreases deflection and increases bearing and seal life. | | X | X | X | X | X | X | X | X | X |
| F Seals: Mechanical seal constructed with a ceramic stationary face and a carbon rotating face. Field-proven for long service life. | Single Seal | X | X | X | X | X | X | X | X | X |
| | Dual Seal: Maximum moisture protection for the motor. | | | | X | X | X | X | X | X |
| G Moisture Probes: Electrical sensors to detect the presence of moisture in the seal chamber before it damages the motor. | Single Probe | | | | X | X | X | | | |
| | Two Probes: Redundant protection from moisture intrusion | | | | | | | X | X | X |
| H Cutters: Reduce solids to the smallest particle size, thereby greatly reducing clogging, roping, or binding. | High efficiency cutter | X | | X | | | | | | |
| | Exclusive "Dual Cutter" design | | X | | X | X | X | X | X | X |
| I Discharge | 1½" NPT vertical discharge | X | X | X | X | | | X | | |
| | 2" NPT vertical discharge | | | | | X | X | | X | X |
| | 3" 125 lb. horizontal flange | | | | | X | X | | X | X |
| J Impeller: Multivane, semiopen impeller precludes material buildup around shaft and seal. | Valox® with insert | X | X | | X | X | X | | | |
| | Cast bronze | | | | X | | | X | X | X |
| K Progressing Cavity: Semipositive Displacement feed system designed specifically for LPS applications. 300 Series stainless steel single lobe rotor and Buna-N double helix stator for extended life. | | | | X | | | | | | |

Pump Details

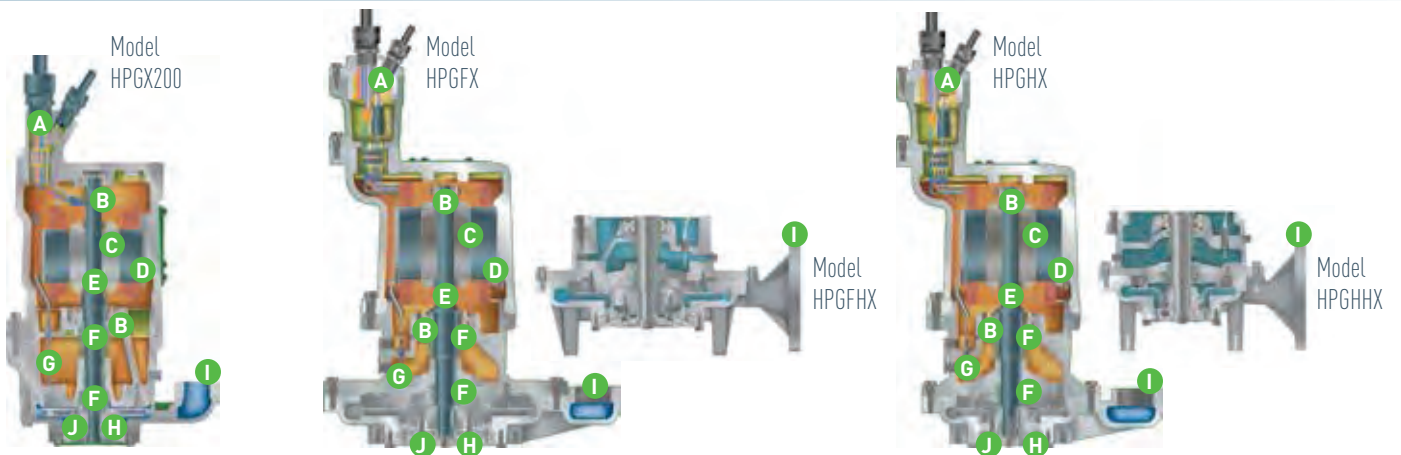
2 HP SUBMERSIBLE GRINDERS



3 – 7.5 HP SUBMERSIBLE GRINDERS



HAZARDOUS LOCATION SUBMERSIBLE GRINDERS





740 EAST 9TH STREET,
ASHLAND, OHIO 44805
WWW.HYDROMATIC.COM

269 TRILLIUM DRIVE, KITCHENER,
ONTARIO, CANADA N2G 4W5
WWW.HYDROMATIC.COM

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APPENDIX D
Barnes Product Data

BARNES[®]

Pressure Sewer Systems

brands you trust.

Engineered Basins

Affordable, effective pressure sewer system

Rocky, hilly, wet and flat topography

Dependable, reliable and cost effective





Barnes Pressure Sewer systems offer a broad range of customized engineered pressure sewer basins with reliable and dependable 2 to 7.5 hp grinder pumps in simplex, duplex, and triplex configurations to the municipal and commercial markets. The basins come in a variety of sizes to fit your specific application with custom control panels, multiple cover options and many accessories to suit your exact needs. The system can also be designed with the highly dependable Barnes ESPS™ level control or traditional float-style controls.

Pump Options

page 3-4

Grinder Pumps are the heart of pressure sewer systems. Barnes offers a wide variety of pump types and sizes to ensure that an optimal Grinder Pump is selected for the specific application. All Barnes grinder pumps utilize the Exclusive Slicerator™ to eliminate potential jams. (Available from factory with pre-wired and tested basin package, not available on 5 hp 1ph models)

Level Control Options

page 4

Several level control and mounting options are available. The ESPS pressure switch option provides the most resistance to grease or solids buildup.

Basin Options

page 5

Barnes Engineered Pressure Sewer basins are available in reinforced fiberglass in multiple diameters and custom lengths to suit simplex, duplex and triplex installations with slide rail or free-standing pump installation.

Cover Options

page 6

A variety of covers, ranging from polyethylene to fiberglass to metal are available depending on size and intended usage.

Control Panel Options

page 6

"Stealth™" wall-mount or free-standing control panels are available in standard or custom configurations. Standard or customized alarm panels for use with "Stealth" panels are also available.

Accessories

page 7

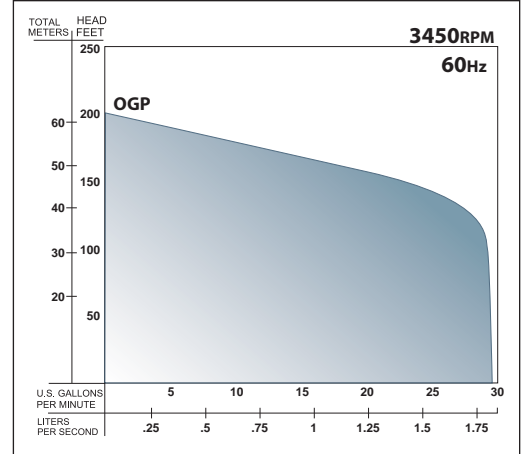
A full range of custom accessories are also available to suit specific needs.



Pump Options

OGP

| | |
|---------------------|--|
| Motor | 2 hp |
| RPM | 3450 |
| Electrical | 240v 1ph 60Hz 200v 3ph 60Hz 240v 3ph 60Hz 480v 3ph 60Hz |
| Cord Length | 30' |
| Construction | cast iron |
| Impeller | vortex bronze |
| Discharge | 1.25" NPT |
| Pump Design | centrifugal |



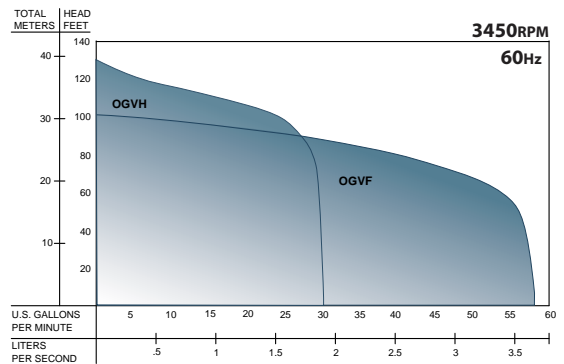
Superior Performance

- Two stage pump design provides high head capability
- Exclusive Slicerator replaceable radial grinder cutter and reversible shredder ring
- Start and run capacitors are located in the motor housing so no expensive control panel required
- UL and CSA (3ph only) listed to assure quality and electrical safety
- Available in manual and automatic version
- Silicon carbide mechanical seal
- Quick connect cord simplifies Installation & Maintenance

This product may be covered by one or more of the following patents and other patent(s) pending: US Patent 7,357,341

OGV

| | |
|---------------------|------------------|
| Motor | 2 hp |
| RPM | 3450 |
| Electrical | 240v 1ph 60Hz |
| Cord Length | 30' |
| Construction | cast iron |
| Impeller | vortex cast iron |
| Discharge | 1.25" NPT |
| Pump Design | centrifugal |



OGV Advantages

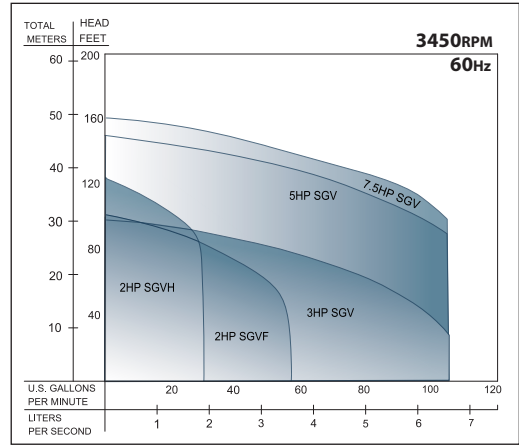
- Recessed vortex impeller design virtually eliminates pump damage from cavitation
- Large pump end bearing and short impeller overhang significantly extend mechanical seal life by minimizing shaft deflection
- Exclusive Slicerator replaceable radial grinder cutter and reversible shredder ring
- Quick connect power cord
- Heavy duty 2hp motor is standard
- Available in manual and automatic version
- Silicon carbide mechanical seal

| SGV | | | |
|---------------------|--|--|---|
| Motor | 2 hp | 3 hp • 5 hp | 7.5 hp |
| RPM | 3450 | 3450 | 3450 |
| Electrical | 200v 1ph & 3ph 60Hz 240v 1ph & 3ph 60Hz 480v 3ph 60Hz 600v 3ph 60Hz | 200v 1ph & 3ph 60Hz 240v 1ph & 3ph 60Hz 480v 3ph 60Hz 600v 3ph 60Hz | 240v 3ph 60Hz 480v 3ph 60Hz 600v 3ph 60Hz |
| Cord Length | 30' | 30' | 30' |
| Construction | cast iron | cast iron | cast iron |
| Impeller | vortex cast iron | vortex cast iron | vortex cast iron |
| Discharge | 1.25" NPT | 2" NPT | 2" NPT |
| Pump Design | centrifugal | centrifugal | centrifugal |



SGV Pump Advantages

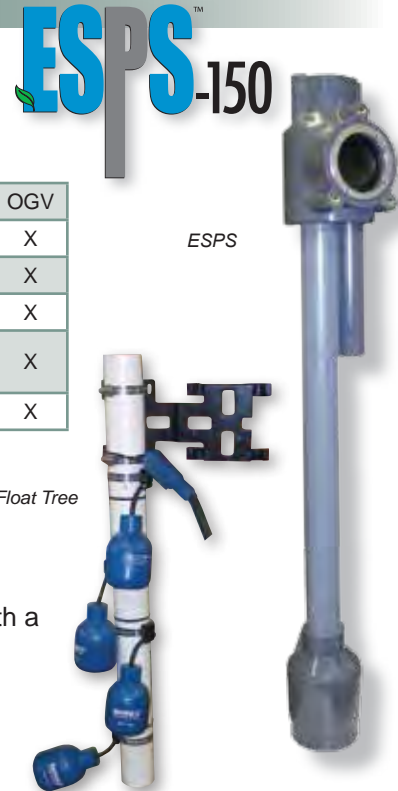
- Unique and robust 3-bearing shaft support design significantly extends mechanical seal life by minimizing shaft deflection
- Recessed vortex impeller design virtually eliminates pump damage from cavitation
- Exclusive Slicerator replaceable radial grinder cutter and reversible shredder ring
- Quick-connect power cord eliminates wiring mistakes (not available on 5 hp 1ph models)
- Double mechanical seal provides clean environment for long life
- Most models are available in explosion-proof construction



* Optional explosion proof motors also available.

Level Control Options

The Environmentally Sealed Pressure Switch, or **ESPS™**, is a highly dependable unitized level control designed specifically for use with standardized pressure sewer packaged systems.



ESPS Design Features

- Pressure switch parts are protected from the basin environment with a Barnes exclusive sealed design.
- Slim, rigid column with NO moving parts. Unit is unaffected by solids, grease buildup, or liquid swirling in basin.
- Mounts easily in Engineered Basins with a rail system using a heavy duty slide bracket.
- NO field adjustment required because operating levels are factory preset.

| | SGV | OGP | OGV |
|----------------------------------|-----|-----|-----|
| ESPS-100 Simplex Manual | X | X | X |
| ESPS-150 Simplex Automatic | | X | X |
| ESPS-200 Duplex Manual | X | X | X |
| Float Tree Simplex/Duplex Manual | X | X | X |
| Automatic Floats | | X | X |

Float Tree

- Simple design
- Field adjustable operating points
- Easily mounts into basin guide rail with a heavy duty slide bracket

This product may be covered by one or more of the following patents and other patent(s) pending:
US Patent 7,578,657

Basin Options

Fiberglass Basin Features:

- Custom molded fiberglass reinforced polyester resin
- Wall thickness sufficient to withstand a water-saturated sand load of 120 lbs per cubic foot with a 1.5 safety factor
- Ballast support flange extends three inches on the radius of the basin
- Basin will withstand a maximum temperature of 150°F
- Factory pre-wiring available
- Simplex or duplex configuration



C-Channel Rail Options:

- Stainless steel discharge piping
- For use with 1.25" and 2" NPT discharge grinder, solids handling, and effluent pumps
- 24" - 72" basin diameters
- 48" - 240" basin lengths



Flex Hose Options:

- EPDM Hose and PVC Piping
- For use with 1.25" NPT discharge grinder
- 24" basin diameter
- 48" - 96" basin lengths



Cover Options

Ultra Cap₂

- Rugged, polyethylene removable self-venting drywell and cover are engineered to fit the 24" and 30" reduced opening diameter basins used on pre-wired package systems.

Molded Polyethylene

- Rugged, light weight rotomolded polyethylene grass green cover that is self-vented and engineered to fit all standard 24" and 30" reduced diameter basins.

Fiberglass

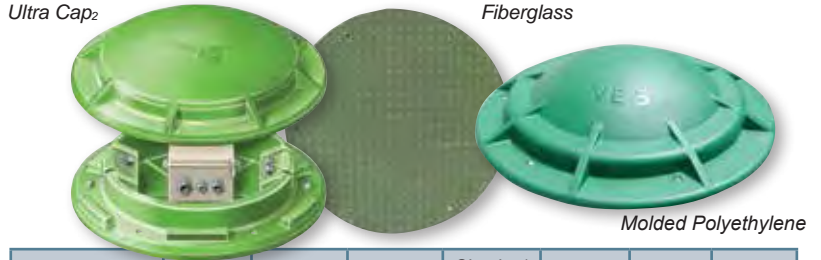
- Reinforced plastic and are grass green in color. Covers for 24" and 30" diameters are 3/8" thick, 36" and 42" diameters are 1/2" thick.

Steel

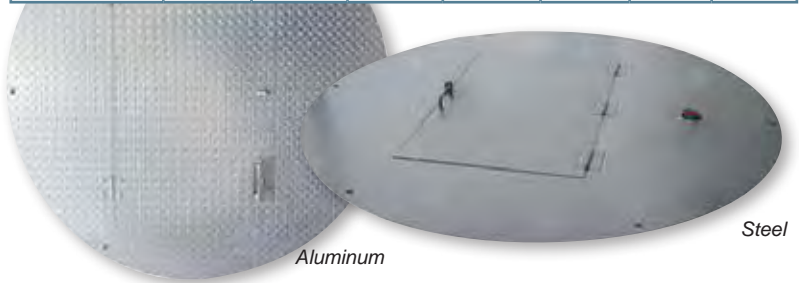
- Steel cover has a black powder coating. Covers available for basin diameters 36" through 60" and are 3/8" thick.

Aluminum

- Available for basin diameters 36" through 60" and are 1/4" thick.



| | Simplex 24 | Reduced 30 | Simplex 30 | Simplex/Duplex 36 | Duplex 42 | Duplex 48 | Duplex 60 |
|------------------------|------------|------------|------------|-------------------|-----------|-----------|-----------|
| Polyethylene | X | X | | | | | |
| Ultra Cap ₂ | X | X | | | | | |
| Aluminum | | | | X | X | X | X |
| Fiberglass | X | X | X | X | X | | |
| Steel | | | | X | X | X | X |



Control Panel Options

Stealth™ Control Panels

Listed by Underwriters Laboratories, simplex and duplex pump control panels provide reliable grinder pump station operation and potential malfunction warning.

Standard Features:

- Simplex and Duplex Wall Mounted Series
- Simplex, Mount Series for Ultra Cap₂ cover
- Non-metallic enclosure
- Padlockable Latch
- Pump and Alarm Circuit Breakers
- IEC Rated Motor Contactor
- Pump Start Push Button
- Terminal Strip and Ground Lug for Incoming Connections
- Alarm light and audible alarm with silence

Optional Features:

- 7 Digit Elapsed Time Meter with running meter indicator
- Transfer switch with easy access reverse pin portable generator receptacle and weatherproof cover
- Moisture sensors
- Intrinsically safe barriers
- Cycle counter

STEALTH™
CONTROL PANELS



Accessories



1. Flexible Inlet Pipe Fittings

The Flexible Pipe fitting is super tough for weather and corrosion resistance. The fitting has superior vapor and water leakproof sealing ability. Available 1¼" thru 6".

2. Flexible Discharge

Braided stainless steel flexible discharge protects against damage from soil settling.

3. Inlet Hubs

Cast iron inlet hubs are recommended for cast iron, ceramic, plastic or ductile iron gravity sewer pipe, and are designed to fit curvature of basin.

4. Electrical Conduit Hubs

Bolt-On Hub, constructed of glass filled nylon.

5. Discharge Couplings

Stainless Steel Bolt-On Couplings available in 1¼", 1½", 2", and 2½" NPT sizes.

6. Bulkhead Fitting

Safety lock design permits safe, quick pipe connection. Fitting comes standard with heavy duty buttress threads to help prevent leaks under pressure.

7. "C" Channel Guide Rails

Rail mounts to the upper and lower horizontal brackets, attached to the basin wall. The rail rests on the bottom of the basin floor, supporting the pump and the required distance from the basin floor. Guide brackets are attached to the pump for positioning of the unit on the guide rail during installation and removal.

8. True Union Ball Valves

Manufactured of Sch. 80 PVC type I with EPDM o-rings for superior chemical and corrosion resistance. 1.25" & 2.00" NPT ball valves are of quick disconnect design with full port bore, ¼ turn leak tight shut-off and NSF listed for use in water service.

9. Ball Check Valve

1.25", 1.50" and 2.00" NPT are available in cast iron or PVC. Works both vertically and horizontal. Ball has sufficient weight to seat tightly and moves freely to open. Head loss is low as the ball is set completely to one side at the maximum rate of flow.

10. Swing Check Valve

Made of high impact Sch. 40 PVC type II material, suitable in systems where fluid is corrosive or contains debris, industrial waste disposal, sewage, etc. The EPDM swing gate lifts to provide unobstructed flow. 1.25" through 2.00" NPT.

11. Swing Check Valve with Integrated Anti-Siphon

Available in 1.25" and 2.00" NPT C-Channel and 1.25" NPT In-Line configurations. Cast iron construction with powder coat finish.

12. Remote Alarm Wall Plate

Allows the homeowner to install a fault warning light indoors. Available in various color options and installs in a standard single gang style enclosure.

About Crane Pumps & Systems

Since 1946, Crane Pumps & Systems has been designing and manufacturing pumps, accessories and systems to provide solutions for municipal water and wastewater, residential, commercial, industrial and military pump market segments. Our trusted brands include Barnes[®], Burks[®], Crown[®], Deming[®], Prosser[®] and Weinman[®].

For more information visit:
Cranepumps.com

About Crane Co.

Crane Pumps & Systems is one of four strong business units that make up Crane Co.'s Fluid Handling segment. Crane Co. is a diversified global manufacturer of engineered industrial products traded on the New York Stock Exchange (NYSE: CR). One of its segments, Crane Fluid Handling, provides highly engineered products for fluid handling applications worldwide.

For more information visit:
Craneco.com

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BARNES

burks

DEMING[®]

WEINMAN[®]

CROWN

PROSSER[®]

APPENDIX E
Water Environment Research Foundation Fact Sheet C2

Performance & Cost of Decentralized Unit Processes



DECENTRALIZED WASTEWATER SYSTEMS

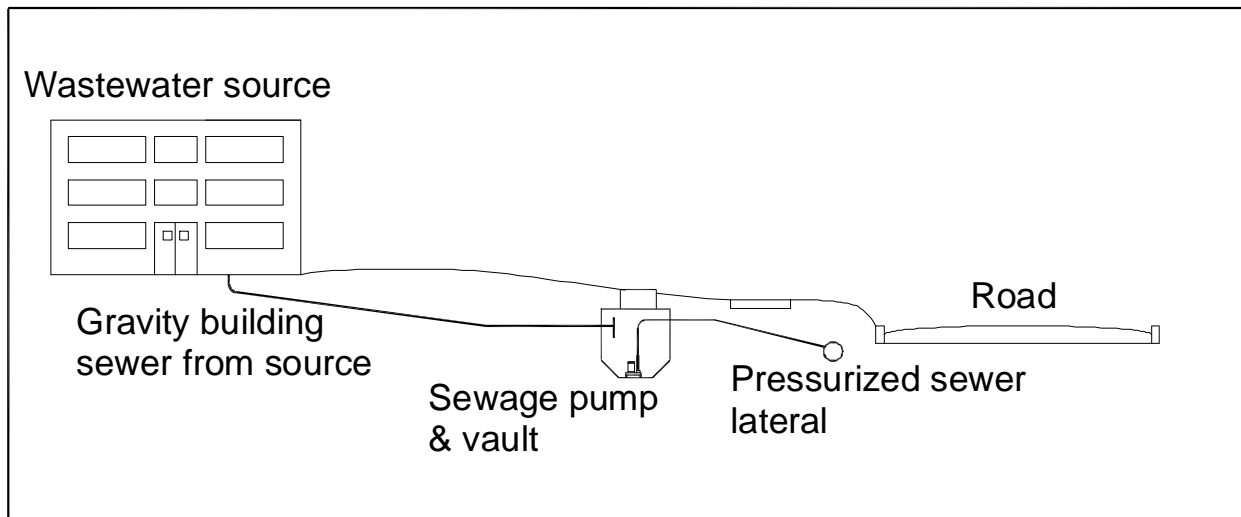
COLLECTION SERIES

PRESSURE SEWER SYSTEMS



Pressure Sewers and Their Use

Pressure sewers are a means of collecting wastewater from multiple sources and delivering the wastewater to an existing collection sewer, and/or to a local or regional treatment facility. Pressurized sewers are not dependent on gravity to move wastewater; and thus there is less concern about the local topography. A typical arrangement is for each connection (or small cluster of connections) to have a basin that receives wastewater. When the basin fills to a set point, a pump within the basin injects wastewater into the sewer. This transfer of wastewater pressurizes the sewer. As various pumps along the length of the sewer inject sewage into the line, the wastewater is progressively moved to the treatment facility.



The principle advantage of pressure sewers is the ability to sewer areas with undulating terrain, rocky soil conditions and high groundwater tables. Because lines are pressurized, sewer pipe installation can follow the surface topography and remain at a relatively constant depth below the soil surface. As compared to gravity sewers, pressure sewers have smaller diameter pipes. Shallower placement, lack of manholes or lift stations and longer sections of smaller diameter piping equates to a less expensive and less obtrusive installation. This is especially true for road crossings. Horizontal directional drilling (HDD) allows

PRESSURE SEWER SYSTEMS

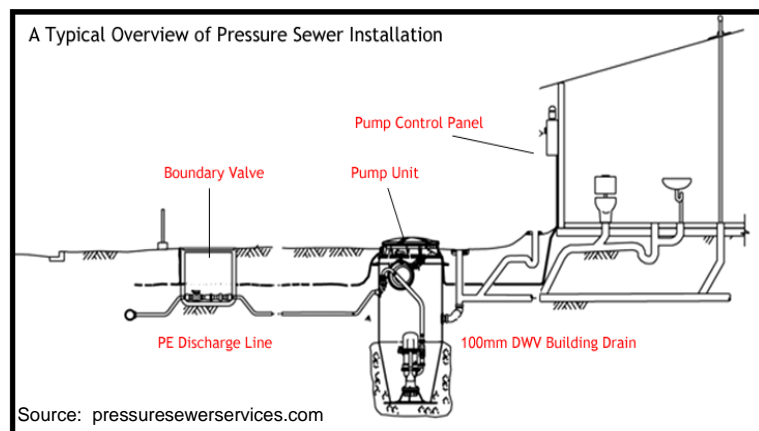
C2

small diameter systems to be installed without disrupting traffic, opening trenches across paved roadways, or moving existing utilities. The piping can also be located along the shoulder instead of the middle of the paved surface.

A community has four basic options when choosing a means of collecting wastewater. This factsheet will focus on solids-handling pumps as a means of taking all the wastewater from a source. The other options are gravity, effluent and vacuum sewers. These three options are discussed in other Fact Sheets in this series. Often, collection technologies can be combined within the same network to provide the best solution for a small community. The most common hybrid includes solids-handling pumps in combination with gravity sewers.

For more information, see:
Factsheet C1: Gravity sewers
Factsheet C3: Effluent sewers
Factsheet C4: Vacuum sewers

The typical installation includes a pump basin at each home or business. This basin provides some wastewater storage. When a designated volume of wastewater has been produced, the pump engages and transfers the sewage into the sewer line. A pump basin for an individual residence typically has a capacity to store about 30 to 70 gallons between pumping events. Each pump basin contains floats or pressure sensors that detect the water depth in the basin. When the predetermined depth is achieved, the pump activates and continues to remove wastewater until a low-water level is reached. Backflow into the pump basin is prevented by a check valve that is integral to the pump. Most pumps operate on 240VAC, which is easily available from the home or business that is being serviced by the pressure sewer system



As a comparison, conventional gravity sewers use a few (but large) lift stations to offset excessive excavations that are often required to achieve minimum slope or to move sewage over hills. Pressure sewers have small pump stations at each connection. There are advantages and disadvantages to each method. For a small community, the primary advantage of pressure sewers is the reduced cost of sewer pipe installation. Small communities have smaller population densities; and therefore, there are fewer people per square mile of service to bear the cost of the system.

C2

PRESSURE SEWER SYSTEMS

Compatibility with Community Vision

Pressure sewer systems are expandable. A community may desire to only provide sewer to the existing population. As new neighborhoods are established, it might be reasonable to connect them to the collection system on an as-needed basis if there is sufficient available capacity. A better solution might be to create a new cluster or neighborhood system to service them. In contrast, conventional gravity sewage collection systems are generally built to accommodate maximum growth that may or may not occur and are difficult to finance through the current users.

Selecting any wastewater collection option must be considered within the context of a community's broad, long-range plans for land use. Changes in development patterns, population density, livability, and delivery of services will occur as a result of the choices made and these must all be taken into account.

A management issue that was addressed early in the history of pressure sewers was that of pump ownership. Some communities chose to put the burden of ownership on the property owners and homeowner associations with disastrous results. Today, pressure sewer systems are wholly maintained by a local utility (either private or public). In most cases, the connection fee includes the cost (including installation) of all the on-lot components. The operation and maintenance costs are amortized into the monthly sewer bill. This level of utility ownership helps to ensure consistent and sustainable performance.

Land Area Requirements for Pressure Sewers

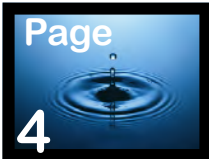
The on-lot land area required for a pressure sewer system is a function of the area required for installation of the pump basin and the piping that connects it to the sewer main. A single-family home will typically have a basin with 30 to 70 gallon capacity installed below ground with a tank lid 18 to 30 inches in diameter that allows access to the pump and controls. Institutional, commercial or industrial facilities (schools, restaurants, supermarkets, apartment complexes factories, etc.) will have larger basins and may require multiple pumps.

Note that additional land area will be required for the treatment and dispersal components selected by the community.

Construction and Installation of Pressure Sewers

Pressure sewer systems can typically be installed with trenchers and small excavators. Trenches for small diameter pipes can often be dug and restored in the same day. The collection network is comprised of mostly two-inch to six-inch diameter plastic pipe. Occasional clean-outs, air release valves at high points, isolation valves, and other components must also be installed within the





PRESSURE SEWER SYSTEMS

C2

network. Large, deep trenches are rarely needed with pressure sewers. The shallower trench width and depth results in minimum surface disturbance, and quicker restoration. Directional boring can reduce highway closures and other urban disruptions and save both time and money. The small diameter piping is flexible and can be routed around obstacles. Pressure sewer mains can often be located on the shoulder of the road.

A licensed electrician must run a circuit from the owner's electrical breaker box out to a sub-breaker box on the exterior of the house or business located near the pump. Once the pump basin has been set, the electrician connects the pump and controls to the owner's electric service.

Licensing requirements for personnel who install pressure sewer systems vary, but they must typically be licensed as a public utility contractor by the state or region in which they work.

Operation and Maintenance for Pressure Sewers

Solids-handling pumps are used under harsh conditions. Corrosive gases and moisture in pump basins will eventually penetrate seals and bushings, resulting in pump failure. These small pumps are designed to be rebuilt, which is more economical than replacing the pump. They are rugged devices, but they are only intended to move the food wastes, fecal solids and the associated paper products, not plastic or metallic objects. When considering the nature of their management program, the community must decide who is financially responsible for pump repair and replacement costs.

Regular service is important for all system components to ensure best long term performance to protect public health and the environment. This also protects the investment. Frequency of operation and maintenance is dependent upon wastewater volume, relative risk to public health and the environment as well as the complexity of components used.

Pressurized sewer systems transmit the entire wastewater flow, thus providing the possibility of oils and fats congealing in the pipe network. System cleaning is not normally required for properly designed systems, but if cleanouts are installed in the network, cleaning procedures are facilitated. It is rare that mainline clearing is required. On-lot service line cleaning can be minimized by requiring all commercial food preparation businesses to install grease interceptors before the grinder pump to remove excessive fats, oils and grease (FOGs).

Because the system is pressurized, it is inherently watertight and groundwater infiltration should not be a problem. However, the pump basins must be periodically inspected to ensure that surface water and groundwater are not entering the system through the building sewer. Illegal connections from downspouts, foundation drains and similar sources must be identified and excluded. Avoiding excessive water inflow prevents overloading the pump and wastewater treatment facility.

C2

PRESSURE SEWER SYSTEMS

Costs for Pressure Sewers

The cost of a pressure sewer system can be divided into two major components: The on-lot cost and the collection network cost. On-lot costs include the pump, basin, controls, building sewer, lateral piping, electrical service, and installation. The collection network includes all the piping in the utility easements that directs the sewage to the treatment facility. A small community may consider several means of funding a pressure sewer system. One means is to secure sufficient funding to install the collection network and install the on-lot components. Federal funding and low interest loans are sometimes available to fund these projects. A second means is for the utility to build the collection network and charge each connection for the on-lot cost. Depending on the style of pump and basin selected by the managing utility, on-lot costs are estimated to be \$4,800 to \$7,200 for an existing single-family home. Typical solids-handling pumps will use less than 1kW-hr of power per day and the electrical cost would be about 50 dollars per year depending upon local electrical rates.



Using many low power-consuming pumps reduces installation cost as compared to a conventional gravity system that may require one or more large-capacity lift stations. Further, it allows more flexibility in choosing locations for and routes to treatment facilities. Larger capacity pumps require three-phase electricity, and this may not be available in remote areas within small communities.

Tables 1-3 are cost estimations for the materials, installation, and maintenance of pressure sewers. These costs assume an estimated average distance between wastewater sources of 200 feet, relatively flat topography, 20% overhead and profit to the contractor, and no sales tax on materials. Engineering fees and other professional services are not included in the costs. Communities may choose to have the lot owners pay for the materials and installation of the on-lot components. Tables 1 and 2 assume that the lot-owner will pay for the system components that are installed on-lot and that the utility will build and maintain the collection network. Table 3 assumes that a utility will build and maintain the collection network and the on-lot components. Tables 2-3 also provide cost estimates for the collection network for three different sizes of communities.

PRESSURE SEWER SYSTEMS

Table 1. Estimated cost to the lot owner if utility does not cover the materials and installation of on-lot components.

| On-Lot Cost | Cost Issues | Costs |
|----------------------------|--|----------------------|
| Materials and Installation | Pump, pump basin, pump controls, excavation, and connection to network | \$4,800 - \$7,200 |
| Annual electrical | Estimated at 1 kW-hr per day (paid by the lot owner) | \$44 - \$66 per yr |
| Annual O&M | Annualized major pump overhaul every 10 years | \$120 - \$240 per yr |

Table 2. Estimated cost of materials and installation to build the collection network not including the on-lot components.

| Network Cost | Wastewater Volume (gpd) | | |
|----------------------------|--|------------------------|-------------------------|
| | 5,000 gpd or 20 homes | 10,000 gpd or 40 homes | 50,000 gpd or 200 homes |
| Materials and Installation | \$33,000 - \$49,000 | \$65,000 - \$98,000 | \$344,000 - \$516,000 |
| Annual O&M | \$6,400 - \$9,600 | \$13,000 - \$19,000 | \$56,000 - \$84,000 |
| Annual electricity | No network energy cost unless lift stations are needed | | |

Table 3. Estimated cost of materials and installation for utility to install both the collection network and on-lot components

| Network and On-Lot Cost | Wastewater Volume (gpd) | | |
|--|-------------------------|-------------------------|---------------------------|
| | 5,000 gpd or 20 homes | 10,000 gpd or 40 homes | 50,000 gpd or 200 homes |
| Materials and Installation | \$132,000 - \$199,000 | \$265,000 - \$397,000 | \$1,341,000 - \$2,012,000 |
| Annual O&M | \$11,000 - \$16,000 | \$21,000 - \$32,000 | \$106,000 - \$159,000 |
| 60 year life cycle cost present value (2009 dollars) | \$243,000 - \$365,000 | \$811,000 - \$1,216,000 | \$4,707,000 - \$6,106,000 |

References

1. Crites, R. and G. Tchobangolous. 1998. Small and Decentralized Wastewater Management Systems. WCB/McGraw Hill Company, Boston, MA.
2. Lenning, D., T. Banathy, D. Gustafson, B.J. Lesikar, S. Wecker, D. Wright. 2005. Technology Overview Text. In (D.L. Lindbo and N.E. Deal eds.) Model Decentralized Wastewater Practitioner Curriculum. National Decentralized Water Resources Capacity Development Project. North Carolina State University, Raleigh, NC.
3. U.S. EPA. 1991. Alternative Wastewater Collection Systems. Office of Water, Technology Transfer Manual, EPA/625/1-91/024, Washington, DC.
4. Water Environment Federation. 2008. Alternative Sewer Systems, Manual of Practice FD-12, Second Edition. WEFPress, Alexandria, Virginia.

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STATUS UPDATE CWA AUTHORITY 2014 - 2017 SEPTIC TANK ELIMINATION PROGRAM (STEP) PROJECTS

| 2014/ 2015 | | | Gravity or Low Pressure (G/LP) ² | Expected No. of Homes | Substantial Completion Expected Year ¹ | Actual Date ¹ | Actual Cost ² | Cost / Connection |
|---------------|---------------------|--|--|-----------------------------|--|-----------------------------|--------------------------|----------------------|
| Line No. | STEP Project No. | STEP Project Name | | | | | | |
| 1 | BL-27-003 | Michigan Street - Pleasant Run Parkway | | 102 | 2015 | 5/1/2015 | \$ 2,363,235 | \$ 23,168.97 |
| 2 | BL-03-001 | 77th Street - Hoover Road | | 173 | 2015 | 9/30/2015 | \$ 3,933,494 | \$ 22,736.96 |
| 3 | BL-09-001B | 62nd Street - Lafayette Road | | 99 | 2015 | 11/9/2015 | \$ 2,437,960 | \$ 24,625.86 |
| 4 | BL-31-002A | Morris Street - Tibbs Avenue | | 254 | 2015 | 10/15/2015 | \$ 6,285,924 | \$ 24,747.73 |
| 7 | BL-39-007 | Earlham Drive - Thompson Road | | 100 | 2016 | 2/2/2016 | \$ 4,207,490 | \$ 42,074.90 |
| 9 | | 75th Street - Westfield Boulevard | | | | | | |
| 21 | BL-04-008 | 77th Street - Riverby Lane | | 167 | 2016 | 9/30/2016 | \$ 3,380,936 | \$ 20,245.13 |
| 11 | | 77th Street - Westfield Boulevard | | | | | | |
| 10 | | 75th Street - Keystone Avenue | | | | | | |
| 8 | BL-04-009 | 74th Street - Ralston Avenue | | 440 | 2016 | 6/26/2016 | \$ 8,565,967 | \$ 19,468.11 |
| 13 | | 71st Street - Ralston Avenue | | | | | | |
| 5 | BL-46-011A | Madison Avenue - Lillac Drive | | 92 | 2016 | 10/26/2016 | \$ 1,534,030 | \$ 16,674.24 |
| NL | BL-27-001C | 24th Street - Eustis Road | | 38 | 2016 | 2/24/2016 | \$ 816,959 | \$ 21,498.92 |
| 6 | | 82nd Street - Westfield Boulevard | LP | | | | | |
| 22 | BL-11-002F | 80th Street - Englewood Drive | LP | 271 | 2017 | 2/17/2017 | \$6,246,398 | \$ 23,049.44 |
| 16 | | 80th Street - Meadowbrook Drive | LP | | | | | |
| | | | Total | 1736 | | | \$ 39,772,393 | \$ 22,910 |

Notes:

¹ Expected Substantial Completion Year is on or before December 31st of a specific year a project will achieve Substantial Completion.

Substantial Completion Date is when the mainline sewer is installed, tested, and available for service connections.

² Actual Cost are costs incurred at the time of CWA's Annual STEP report under Cause No. 44305.

CWA AUTHORITY, INC.
Cause No. 45151

Prepared by:
Jim Parks / OUCC
January 18, 2019

CWA Authority, Inc.
Cause No. 44305
STEP Compliance Filing – June 30, 2014
Attachment A

| 2015 - 2019 SEPTIC TANK ELIMINATION PROGRAM (STEP) PROJECTS | | | | | | |
|---|------------------|-------------------------------------|-----------------------|--------------------------|------------------------|-------------------|
| CITIZENS ENERGY GROUP - CWA AUTHORITY | | | | | | |
| Line No. | STEP Project No. | STEP Project Name | Expected No. of Homes | Expected Completion Year | Actual Completion Date | Final Actual Cost |
| 1 | BL-27-003 | Michigan St - Pleasant Run Parkway | 102 | 2015 | | |
| 2 | BL-03-001 | 77th Street - Hoover Road | 177 | 2015 | | |
| 3 | BL-09-001B | 62nd Street - Lafayette Road | 96 | 2015 | | |
| 4 | BL-31-002A | Morris Street - Tibbs Avenue | 238 | 2015 | | |
| 5 | BL-46-011A | Madison Avenue - Lilac Drive | 93 | 2016 | | |
| 6 | BL-11-002F | 82nd Street - Westfield Boulevard | 88 | 2016 | | |
| 7 | BL-39-007 | Earlham Drive - Thompson Road | 81 | 2016 | | |
| 8 | BL-04-007 | 74th Street - Ralston Avenue | 84 | 2016 | | |
| 9 | BL-04-008 | 75th Street - Westfield Boulevard | 73 | 2016 | | |
| 10 | BL-04-009 | 75th Street - Keystone Avenue | 218 | 2016 | | |
| 11 | BL-04-010 | 77th Street - Westfield Boulevard | 50 | 2016 | | |
| 12 | BL-43-007 | Mills Road - Trotter Road | 82 | 2016 | | |
| 13 | BL-11-002C | 71st Street - Ralston Avenue | 126 | 2016 | | |
| 14 | BL-10-024 | 54th Street - Riverview Drive | 309 | 2017 | | |
| 15 | BL-23-003A | Rockville Road - High School Road | 223 | 2017 | | |
| 16 | BL-04-011 | 80th Street - Meadowbrook Drive | 112 | 2017 | | |
| 17 | BL-49-001C | Acton Road - Southeastern Avenue | 169 | 2017 | | |
| 18 | BL-11-002B | 69th Street - Kingsley Drive | 117 | 2018 | | |
| 19 | BL-11-002D | 64th Street - Evanston Avenue | 135 | 2018 | | |
| 20 | BL-11-005A | 64th Street - Keystone Avenue | 117 | 2018 | | |
| 21 | BL-04-008A | 77th Street - Riverby Lane | 23 | 2018 | | |
| 22 | BL-04-012 | 80th Street - Edgewood Drive | 74 | 2018 | | |
| 23 | BL-05-005A | 77th Street - Allisonville Road | 109 | 2018 | | |
| 24 | BL-12-008A | 55th Street - Allisonville Road | 143 | 2018 | | |
| 25 | BL-12-010 | 50th Street - Allisonville Road | 121 | 2018 | | |
| 26 | BL-38-001 | Thompson Road - East Street | 124 | 2018 | | |
| 27 | BL-04-004 | 86th Street - Haverstick Road | 233 | 2019 | | |
| 28 | BL-04-005A | 91st Street - Tacoma Avenue | 58 | 2019 | | |
| 29 | BL-18-001 | Millersville Road - Keystone Avenue | 42 | 2019 | | |
| 30 | BL-27-009 | Routiers Avenue - 10th Street | 15 | 2019 | | |
| 31 | BL-27-010 | 10th Street - Devon Avenue | 17 | 2019 | | |
| 32 | BL-39-006 | Thompson Road - Meridian Street | 176 | 2019 | | |
| 33 | BL-31-001A | Thompson Road - Senate Avenue | 289 | 2019 | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| NOTES: | | | | | | |
| 1) Completion Year means that on or before December 31st of a specific year a project will achieve Substantial Completion | | | | | | |
| 2) Completion = Certificate of Substantial Completion when sewer is available for service connection | | | | | | |

CWA Authority, Inc.
Cause No. 44305
STEP Compliance Filing - June 1, 2015
Attachment A

| STATUS UPDATE | | | | | | |
|---|------------------|-------------------------------------|-----------------------|--------------------------|------------------------|-------------------|
| 2015 - 2019 SEPTIC TANK ELIMINATION PROGRAM (STEP) PROJECTS | | | | | | |
| CITIZENS ENERGY GROUP - CWA AUTHORITY | | | | | | |
| Line No. | STEP Project No. | STEP Project Name | Expected No. of Homes | Expected Completion Year | Actual Completion Date | Final Actual Cost |
| 1 | BL-27-003 | Michigan St - Pleasant Run Parkway | 102 | 2015 | 5/1/2015 | \$2,249,867 |
| 2 | BL-03-001 | 77th Street - Hoover Road | 177 | 2015 | In Construction | |
| 3 | BL-09-001B | 62nd Street - Lafayette Road | 96 | 2015 | In Construction | |
| 4 | BL-31-002A | Morris Street - Tibbs Avenue | 238 | 2015 | In Construction | |
| 5 | BL-46-011A | Madison Avenue - Lilac Drive | 93 | 2016 | | |
| 6 | BL-11-002F | 82nd Street - Westfield Boulevard | 88 | 2017 | In Procurement | |
| 7 | BL-39-007 | Earlham Drive - Thompson Road | 81 | 2016 | In Construction | |
| 8 | BL-04-007 | 74th Street - Ralston Avenue | 84 | 2016 | In Procurement | |
| 9 | BL-04-008 | 75th Street - Westfield Boulevard | 73 | 2016 | In Procurement | |
| 10 | BL-04-009 | 75th Street - Keystone Avenue | 218 | 2016 | In Procurement | |
| 11 | BL-04-010 | 77th Street - Westfield Boulevard | 50 | 2016 | In Procurement | |
| 12 | BL-43-007 | Mills Road - Trotter Road | 82 | 2017 | | |
| 13 | BL-11-002C | 71st Street - Ralston Avenue | 126 | 2016 | In Procurement | |
| 14 | BL-10-024 | 54th Street - Riverview Drive | 309 | 2017 | | |
| 15 | BL-23-003A | Rockville Road - High School Road | 223 | 2017 | | |
| 16 | BL-04-011 | 80th Street - Meadowbrook Drive | 112 | 2017 | In Procurement | |
| 17 | BL-49-001C | Acton Road - Southeastern Avenue | 169 | 2017 | | |
| 18 | BL-11-002B | 69th Street - Kingsley Drive | 117 | 2018 | | |
| 19 | BL-11-002D | 64th Street - Evanston Avenue | 135 | 2018 | | |
| 20 | BL-11-005A | 64th Street - Keystone Avenue | 117 | 2018 | | |
| 21 | BL-04-008A | 77th Street - Riverby Lane | 23 | 2016 | In Procurement | |
| 22 | BL-04-012 | 80th Street - Englewood Drive | 74 | 2016 | In Procurement | |
| 23 | BL-05-005A | 77th Street - Allisonville Road | 109 | 2018 | | |
| 24 | BL-12-008A | 55th Street - Allisonville Road | 143 | 2018 | | |
| 25 | BL-12-010 | 50th Street - Allisonville Road | 121 | 2018 | | |
| 26 | BL-38-001 | Thompson Road - East Street | 124 | 2018 | | |
| 27 | BL-04-004 | 86th Steet - Haverstick Road | 233 | 2019 | | |
| 28 | BL-04-005A | 91st Street - Tacoma Avenue | 58 | 2019 | | |
| 29 | BL-18-001 | Millersville Road - Keystone Avenue | 42 | 2019 | | |
| 30 | BL-27-009 | Routlers Avenue - 10th Street | 15 | 2019 | | |
| 31 | BL-27-010 | 10th Street - Devon Avenue | 17 | 2019 | | |
| 32 | BL-39-006 | Thompson Road - Meridian Street | 176 | 2019 | | |
| 33 | BL-31-001A | Thompson Road - Senate Avenue | 289 | 2019 | | |
| NOTES: | | | | | | |
| 1) Completion Year means that on or before December 31st of a specific year a project will achieve Substantial Completion | | | | | | |
| 2) Completion = Certificate of Substantial Completion when sewer is available for service connection. | | | | | | |

CWA Authority, Inc.
Cause No. 44305
STEP Compliance Filing - June 1, 2016
Attachment A

STATUS UPDATE
CITIZENS ENERGY GROUP - CWA AUTHORITY
2015 - 2020 SEPTIC TANK ELIMINATION PROGRAM (STEP) PROJECTS

| Line No. | STEP Project No. | STEP Project Name | Expected No. of Homes | Expected Substantial Completion Year ¹ | Actual Substantial Completion Date ¹ | Actual Cost ² |
|----------|------------------|-------------------------------------|-----------------------|---|---|--------------------------|
| 1 | BL-27-003 | Michigan St - Pleasant Run Parkway | 102 | 2015 | 5/1/2015 | \$ 2,363,235 |
| 2 | BL-03-001 | 77th Street - Hoover Road | 173 | 2015 | 9/30/2015 | \$ 3,933,494 |
| 3 | BL-09-001B | 62nd Street - Lafayette Road | 99 | 2015 | 11/9/2015 | \$ 2,437,960 |
| 4 | BL-31-002A | Morris Street - Tibbs Avenue | 254 | 2015 | 10/15/2015 | \$ 6,285,924 |
| 5 | BL-39-007 | Earlham Drive - Thompson Road | 100 | 2016 | 2/2/2016 | \$ 4,207,490 |
| 6 | BL-04-008 | 75th Street - Westfield Boulevard | 167 | 2016 | | |
| 7 | | 77th Street - Riverby Rd | | 2016 | | |
| 8 | | 77th Street - Westfield Boulevard | | 2016 | | |
| 9 | BL-04-009 | 75th Street - Keystone Avenue | 440 | 2016 | | |
| 10 | | 74th Street - Ralston Avenue | | 2016 | | |
| 11 | | 71st Street - Ralston Avenue | | 2016 | | |
| 12 | BL-46-011A | Madison Avenue - Lilac Drive | 92 | 2016 | | |
| 13 | BL-27-001C | 24th Street - Eustis Road | 38 | 2016 | 2/24/2016 | \$ 464,957 |
| 14 | BL-11-002F | 82nd Street - Westfield Boulevard | 271 | 2017 | | |
| 15 | | 80th Street - Englewood Drive | | 2017 | | |
| 16 | | 80th Street - Meadowbrook Drive | | 2017 | | |
| 17 | BL-23-003A | Rockville Road - High School Road | 221 | 2017 | | |
| 18 | | Rockville Road - Furman Avenue | | 2017 | | |
| 19 | BL-10-024 | 54th Street - Riverview Drive | 315 | 2017 | | |
| 20 | BL-19-001 | 46th Street - Binford Boulevard | 43 | 2017 | | |
| 21 | BL-11-002E | 72nd Street - Westfield Boulevard | 61 | 2017 | | |
| 22 | BL-18-001 | Millersville Road / Keystone Avenue | 55 | 2017 | | |
| 23 | BL-39-006 | Thompson Road - Meridian Road | 176 | 2018 | | |
| 24 | BL-38-001A | Thompson Road - Senate Avenue | 289 | 2018 | | |
| 25 | BL-11-005D | 79th Street - Keystone Avenue | 48 | 2018 | | |
| 26 | BL-21-001 | 42nd Street - German Church Road | 6 | 2018 | | |
| 27 | BL-05-006A | 77th Street - Dean Road | 107 | 2018 | | |
| 28 | BL-27-004 | 21st Street - Post Road | 18 | 2018 | | |
| 29 | BL-11-007 | 58th Street - Stone Hill Drive | 11 | 2018 | | |
| 30 | BL-11-002B | 69th Street - Kingsley Drive | 117 | 2018 | | |
| 31 | BL-31-002D | Troy Avenue - Harding Street | 131 | 2018 | | |
| 32 | BL-12-012 | 71st Street - Tuxedo Avenue | 156 | 2019 | | |
| 33 | BL-12-006 | 71st Street - Oakland Avenue | 178 | 2019 | | |
| 34 | BL-11-005C | 71st Street - Tacoma Avenue | 113 | 2019 | | |
| 35 | BL-30-057 | Fleming Street - Murray Street | 11 | 2019 | | |
| 36 | BL-11-006 | 70th Place - College Avenue | 8 | 2019 | | |
| 37 | BL-27-010 | 10th Street - Devon Avenue | 17 | 2019 | | |
| 38 | BL-45-007 | Banta Road - Bluffcrest Court | 41 | 2019 | | |
| 39 | BL-38-006 | Edgewood Avenue - Bluffcrest Court | 23 | 2019 | | |
| 40 | BL-27-009 | Routiers Avenue - 10th Street | 15 | 2019 | | |
| 41 | BL-43-007 | Mills Road - Trotter Road | 84 | 2019 | | |
| 42 | BL-12-011 | 56th Street - Fall Creek Parkway | 167 | 2019 | | |
| 43 | BL-19-070B | 27th Street - Layman Avenue | 16 | 2019 | | |
| 44 | BL-22-035A | Raceway Road - Crossford Way | 8 | 2020 | | |
| 45 | BL-27-013 | Peachtree Lane - Alige Avenue | 61 | 2020 | | |

CWA Authority, Inc.
Cause No. 44305
STEP Compliance Filing - June 1, 2016
Attachment A

STATUS UPDATE
CITIZENS ENERGY GROUP - CWA AUTHORITY
2015 - 2020 SEPTIC TANK ELIMINATION PROGRAM (STEP) PROJECTS

| Line No. | STEP Project No. | STEP Project Name | Expected No. of Homes | Expected Substantial Completion Year ¹ | Actual Substantial Completion Date ¹ | Actual Cost ² |
|----------|------------------|-----------------------------------|-----------------------|---|---|--------------------------|
| 46 | BL-48-006 | Long Branch Drive - Fry Road | 23 | 2020 | | |
| 47 | BL-48-005A | Franklin Road - McGregor Road | 37 | 2020 | | |
| 48 | BL-04-005A | 91st Street - Tacoma Avenue | 60 | 2020 | | |
| 49 | BL-04-004 | 86th Street - Haverstick Road | 233 | 2020 | | |
| 50 | BL-04-066G | 91st Street - Westfield Boulevard | 33 | 2020 | | |
| 51 | BL-40-001B | Chamberland Drive - Carson Avenue | 39 | 2020 | | |
| 52 | BL-40-001A | Redfern Drive - Carson Avenue | 34 | 2020 | | |
| 53 | BL-12-010 | 50th Street - Allisonville Road | 121 | 2020 | | |
| 54 | BL-12-008A | 55th Street - Allisonville Road | 143 | 2020 | | |
| 55 | BL-33-059 | Churchman Road - Perkins Avenue | 102 | 2020 | | |

Notes:

¹ Expected Substantial Completion Year is on or before December 31st of a specific year a project will achieve Substantial Completion. Substantial Completion Date is when the mainline sewer is installed, tested, and available for service connections

² Actual Cost are costs incurred at the time of this report.

CWA Authority, Inc.
Cause No. 44305
STEP Compliance Filing - May 31, 2017
Attachment A

STATUS UPDATE
CITIZENS ENERGY GROUP - CWA AUTHORITY
2016 - 2021 SEPTIC TANK ELIMINATION PROGRAM (STEP) PROJECTS

| Line No. | STEP Project No. | STEP Project Name ³ | Expected No. of Homes | Expected Substantial Completion Year ¹ | Actual Substantial Completion Date ¹ | Actual Cost ² |
|----------|------------------|---|-----------------------|---|---|--------------------------|
| 1 | BL-04-008 | 75th Street - Westfield Boulevard | 167 | 2016 | 9/30/2016 | \$ 3,380,936 |
| 2 | | 77th Street - Riverby Road | | | | |
| 3 | | 77th Street - Westfield Boulevard | | | | |
| 4 | BL-04-009 | 75th Street - Keystone Avenue | 440 | 2016 | 6/26/2016 | \$ 8,565,967 |
| 5 | | 74th Street - Ralston Avenue | | | | |
| 6 | | 71st Street - Ralston Avenue | | | | |
| 7 | BL-46-011A | Madison Avenue - Lilac Drive | 92 | 2016 | 10/26/2016 | \$ 1,534,030 |
| 8 | BL-27-001C | 24th Street - Eustis Road | 38 | 2016 | 2/24/2016 | \$ 816,959 |
| 9 | BL-11-002F | 82nd Street - Westfield Boulevard | 271 | 2017 | 2/17/2017 | \$ 2,348,056 |
| 10 | | 80th Street - Englewood Drive | | | | |
| 11 | | 80th Street - Meadowbrook Drive | | | | |
| 12 | BL-23-003A | Rockville Road - High School Road (Rockville Road - Furman Avenue) | 221 | 2018 | | |
| 13 | BL-19-001 | 46th Street - Binford Boulevard | 43 | 2018 | | |
| 14 | BL-39-006 | Thompson Road - Meridian Road (Thompson Road - Senate Avenue) | 465 | 2018/2019 | | |
| 15 | BL-11-005D | 79th Street - Keystone Avenue | 48 | 2020 | | |
| 16 | BL-21-001 | 42nd Street - German Church Road | 6 | 2020 | | |
| 17 | BL-05-006A | 77th Street - Dean Road | 107 | 2020 | | |
| 18 | BL-11-002E | 72nd Street - Westfield Boulevard | 61 | 2020 | | |
| 19 | BL-27-004 | 21st Street - Post Road | 18 | 2020 | | |
| 20 | BL-11-007 | 58th Street - Stone Hill Drive | 11 | 2020 | | |
| 21 | BL-12-012 | 71st Street - Tuxedo Avenue (71st Street - Oakland Avenue, 71st Street - Tacoma Avenue) | 447 | 2020/2021 | | |

Notes:

¹ Expected Substantial Completion Year is on or before December 31st of a specific year a project will achieve Substantial Completion. Substantial Completion Date is when the mainline sewer is installed, tested, and available for service connections.

² Actual Cost are costs incurred at the time of this report.

³ Projects shown in parenthesis have been clustered with primary project.

CWA Authority, Inc.
Cause No. 44305
STEP Compliance Filing - May 31, 2018
Attachment A

STATUS UPDATE
CITIZENS ENERGY GROUP - CWA AUTHORITY
2017 - 2022 SEPTIC TANK ELIMINATION PROGRAM (STEP) PROJECTS

| Line No. | STEP Project Number | STEP Project Name ¹ | Gravity or Low Pressure (G/LP) ² | Expected No. of Homes | Expected Substantial Completion Year ³ | Actual Substantial Completion Date ³ | Actual Cost ⁴ |
|----------|---------------------|---|---|-----------------------|---|---|--------------------------|
| 1 | BL-11-002F | 82nd Street - Westfield Boulevard | LP | 271 | 2017 | 2/17/2017 | \$ 6,246,398 |
| | | 80th Street - Englewood Drive | LP | | | | |
| | | 80th Street - Meadowbrook Drive | LP | | | | |
| 2 | BL-19-001 | 46th Street - Binford Boulevard | LP | 43 | 2018 | | \$ 80,352 |
| 3 | BL-17-007 | 46th Street - Ritter Ave | LP | 25 | 2019 | | |
| 4 | BL-23-003A | Rockville Road - High School Road (Rockville Road - Furman Avenue) | LP | 221 | 2019 | | |
| 5 | BL-39-006 | Thompson Road - Meridian Road (Thompson Road - Senate Avenue) | LP | 465 | 2019/2020 | | |
| 6 | BL-11-005D | 79th Street - Keystone Avenue | LP | 48 | 2020 | | |
| 7 | BL-21-001 | 42nd Street - German Church Road | LP | 6 | 2020 | | |
| 8 | BL-05-006A | 77th Street - Dean Road | LP | 107 | 2020/2021 | | |
| 9 | BL-11-002E | 72nd Street - Westfield Boulevard | LP | 61 | 2021 | | |
| 10 | BL-27-004 | 21st Street - Post Road | LP | 18 | 2021 | | |
| 11 | BL-11-007 | 58th Street - Stone Hill Drive | LP | 11 | 2021 | | |
| 12 | BL-12-012 | 71st Street - Tuxedo Avenue (71st Street - Oakland Avenue, 71st Street - Tacoma Avenue) | LP | 447 | 2021/2022 | | |
| 13 | BL-18-001 | Millersville Road - Keystone Avenue | LP | 55 | 2022 | | |
| 14 | BL-30-057 | Fleming Street - Murray Street | LP | 11 | 2022 | | |
| 15 | BL-11-002B | 69th Street - Kingsley Drive | LP | 117 | 2022 | | |

Notes:

1. Projects shown in parenthesis have been clustered with primary project.
2. Project identified as a gravity (G) or low pressure (LP) system.
3. Expected Substantial Completion Year is on or before December 31st of a specific year a project will achieve Substantial Completion. Substantial Completion Date is when the mainline sewer is installed, tested, and available for service connections.
4. Actual Cost are costs incurred at the time of this report. Based on the actual costs presented for the project included in this report that achieved Substantial Completion, the average cost for STEP per home is approximately \$23,049. However, the overall average program cost per home of STEP projects that have been completed is \$17,000.



| | |
|--------------|--|
| From: | John Trypus, Director Capital Programs and Engineering |
| To: | Mark Jacob, Vice President Capital Programs and Engineering |
| Date: | October 27, 2017 |
| RE: | Septic Tank Elimination Program Whitepaper |

Purpose:

The purpose of this whitepaper is to highlight the Septic Tank Elimination Program (STEP) and the program’s evolution and contribution of the Long Term Control Plan (LTCP) in regards to the reduction of the number of days that area waterways test positive for the E. coli daily maximum standard.

Summary:

A brief rationale and approach for the STEP program is discussed while also explaining the contribution to the LTCP. The Indianapolis area’s expansive development has made STEP a critical program in reducing the biological waterway hazards stemming from failing septic systems.

This history of the program is presented, explaining how the current STEP program’s total cost per home has decreased by approximately 40% since the Barrett Law Program. Throughout the years of evolution, the program has utilized advances in technologies, categorical management, and financial redistributions to improve the overall effectiveness and efficiency of the STEP projects.

Along with the program evolution, the project area identification and prioritization has also developed into quantifiable metrics which focuses on three primary criteria. This prioritization has a critical role in the identifying the remaining “high priority” homes from the originally identified 18,000 priority homes across Marion County, as established in 2010. Within the 5,000 remaining priority homes that have not been connected through the STEP program, 3,000 high priority homes will be connected by the end of 2025.

The Customer Petitioning Process and future project procurement offer additional value to the STEP program. The Underground Engineering and Construction department will continue to proactively seek additional cost savings and efficiency improving techniques which can be implemented to assist in the reduction of waterway bacteria which cause significant harm to the Indianapolis community.

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Introduction

Onsite wastewater disposal facilities, typically called septic systems, provide wastewater treatment for homes in areas where centralized wastewater treatment service is not available. Figure 1, taken from the website of the Marion County Public Health Department, shows a typical septic system configuration. Waste flow from the home is collected in the septic tank, where naturally-occurring microorganisms break down the waste. The resulting solids settle, and the clarified water flows into the leach field, where it permeates into the soil.

The science behind septic systems forms the foundation for centralized wastewater treatment. Properly designed and maintained systems operate well and provide quality treated effluent.

Unfortunately, a number of factors can lead to subpar septic system performance over time. These systems are generally owned and maintained by the homeowner. As such, routine preventative maintenance is often not performed. When not regularly maintained, solids build up within the system, eventually passing into the leach field and impeding infiltration. Inadequate treatment time results in raw sewage seeping through the ground, often times entering and contaminating water ways and groundwater sources. Systems in porous soils (sandy or limestone) can percolate flow too quickly, without adequate time for microorganisms to treat the sewage. Conversely, compact soils like clay, impede infiltration and redirect flows into nearby waterways. Systems also require large areas to work effectively. Areas dense with systems, such as urban settings, can have a higher water table, reducing the effectiveness of the leach field component.

Failing septic systems are significant contributors to many of the country's most severe water pollution problems, including toxic algae blooms, lack of oxygen in waterways, and disease-causing microorganisms, particularly E. coli bacteria. In addition, studies are finding that hormones and pharmaceuticals are also entering waterways from septic systems.

Historically, Indianapolis has ranked high in the number of septic systems among cities of comparable sizes, ranking only behind Jacksonville, Florida. These systems are generally located in urban areas, often times on lots less than one acre in size. Most of these systems were installed when the homes were originally constructed and have since outlasted their typical life expectancy. This, combined with the dense concentration and inadequate maintenance over the years, has resulted in wide-spread system failures and sewage seeping into groundwater, backyards, neighborhood ditches, and streams. Raw sewage from failing septic systems has been linked to high E. coli bacteria counts in many small



Figure 1: Typical Septic System

<http://marionhealth.org/onsite-sewage-septic-systems-program/>

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neighborhood streams and ditches during dry weather, when children are most likely to play in them. In addition, failing septic systems can lead to potential contamination of a home's water wells; shower, bathing, and toilet systems that cannot be fully utilized; washing machines that cannot be fully utilized; septic system backups; and odor problems. In cases where the failing septic system cannot be addressed, the Health Department can condemn the home, if they deem the failing system to be a threat to human safety.

As discussed further under the Septic Tank Elimination Program (STEP) section below, the City of Indianapolis *Raw Sewage Overflow Long Term Control Plan and Water Quality Improvement Report* (LTCP) developed as part of the Indianapolis' Federal Consent Decree recognizes the adverse impact to water quality of failing septic systems in Marion County. The LTCP states that "Combined sewer overflow (CSO) control alone will not sufficiently reduce the days of exceedance of the E. coli daily maximum bacteria standard of 235 E. coli colonies/100 mL without implementing a comprehensive program to reduce other bacterial sources throughout the watershed, such as failing septic systems and stormwater discharges" (City of Indianapolis, 2006). If STEP is discontinued, the Environmental Protection Agency (EPA) and the Indiana Department of Environmental Management (IDEM) could require the Utility to implement additional controls under their National Pollution Discharge Elimination System (NPDES) permits. Additionally, IDEM and EPA could seek additional CSO control investments by the Utility in order to help meet the water quality standards, and it is likely that the additional controls would prove to be more costly and less effective than STEP.

Because of these issues, there has been an extensive effort by the City of Indianapolis, and now Citizens Energy Group (Citizens), to construct new sewer infrastructure and convert many but not all neighborhoods on septic systems to the sanitary sewer system.

Program History

Over the years, the City of Indianapolis has used a variety of tools for mitigating septic systems within the community. With the acquisition of the wastewater utility in 2011, responsibility for this effort was assumed by Citizens. An overview of the evolution of the program is described below.

Barrett Law Program (Pre – 2004)

Starting in 1889, Indianapolis used a set of statutes known as the "Barrett Law" to pay for sewer infrastructure. The Barrett Law empowered municipalities to divide new infrastructure costs among homeowners served. The City began to formalize these efforts in 1998 with the creation and implementation of the Barrett Law Master Plan (BLMP). The BLMP identified almost 30,000 homes throughout Marion County and established a plan for systematically replacing them with sanitary sewer service.

Under the Barrett Law Program, projects were designed and constructed by the Department of Public Works (DPW). Projects were initiated in one of two ways: property owners within an identified neighborhood could petition DPW to bring sewer to their area, or the Health Department could request

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sewer service for a targeted area, based on reported septic system failures. Projects were approved by the Board of Public Works prior to construction. Infrastructure costs were divided among homeowners served, and homeowners had various payment options for these assessments. The DPW Board members approved a modified process of determining the assessments to the homeowners using the average appraised value of the properties within the project area, and capping the cost to no more than 10 percent of the value. This required a portion of the project to be funded by the City. In addition to the assessments, homeowners were also required to hire a licensed and bonded general contractor or plumber to install the lateral connection from their house to the mainline and to abandon their septic system, which proved to be a very costly expense.

Construction of new sewers in a neighborhood served by private septic systems was expensive and very invasive. While designing the systems, the goal was to maintain gravity flow throughout the systems as much as possible, periodically using lift stations as needed. As a result, construction projects often disrupted neighborhoods for extended periods. Additionally, outside consultants were used to prepare detailed bidding packages, and full-time inspection was required throughout construction. This level of effort resulted in very high assessments for homeowners.

The Barrett Law was a very useful tool for DPW; however, it resulted in wide-spread negative opinions from customers, primarily due to high assessment costs and disruptive construction.

Septic Tank Elimination Program (2005 to 2015)

In 2005, the City implemented STEP to replace the Barrett Law Program. Recognizing the excessive financial burden of Barrett Law projects on homeowners, the City modified its approach to serving unsewered neighborhoods by establishing a flat fee of \$2,766 (comprised of \$2,530 connection fee and \$236 permit fee) for homeowners to connect. The remainder of project costs to construct the mainline sewer would be paid through user fees. Homeowners were still responsible for their individual connections to the newly-constructed sewer system and abandonment of their existing septic systems.

The engineering/construction approach for the STEP program remained the same. Gravity sewers were used to the extent possible, resulting in large, disruptive construction projects. Outside consultants provided design and construction inspection services. The primary difference as compared to the Barrett Law program is that this approach significantly reduced the cost to individual homeowners within the project areas, making it more affordable for them to connect to the new system.

In addition, in 2006, the City entered into a Federal Consent Decree with the United States Department of Justice, EPA, and IDEM to improve water quality in the streams and rivers around Indianapolis caused by CSOs. A LTCP was developed to outline the City's approach for addressing the CSO problems. Though not explicitly included in the LTCP, STEP was discussed at various points during negotiations with IDEM/EPA, and all parties acknowledged the positive impacts the program has on water quality in nearby waterways. The LTCP specifically references STEP as one of the non-CSO improvements that the Utility would consider at their sole discretion to "maximize the benefits to water quality, stream aesthetics, and human health" (LTCP, 2006). Studies completed by the City and Citizens indicate that

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implementation of the priority STEP projects is a more cost-effective approach to achieving in-stream water quality standards than undertaking additional CSO control measures.

It was determined that many of the targeted areas were located near waterways, providing a conduit for pollution from failing septic systems to enter these waterways further worsening the pollution caused by CSOs. The STEP program was analyzed to confirm that implementation of priority areas will help reduce the quantity of e coli bacteria found in the City's waterways.

In 2010, the STEP Master Plan was developed to:

- Update the BLMP to incorporate changes that had occurred since 1998.
- Identify unsewered homes that were not identified in the BLMP.
- Develop a more systematic, objective approach to selecting STEP projects for construction.
- Prepare an updated inventory of potential STEP project areas (including newly identified STEP areas).
- Update the project prioritization system, identify associated capital improvement needs, and develop project cost estimates, and update project schedules.
- Recommend a STEP Implementation Plan.

In 2011, Citizens Energy Group acquired the wastewater utility from the City, assuming responsibility for the entire wastewater utility, including STEP and the Federal Consent Decree and Long Term Control Plan. The STEP program was adapted using Citizen's proposal process in lieu of bidding and to achieve best value through category management initiatives.

Updated Septic Tank Elimination Program (2016 to present)

As part of the continuous improvement process, Citizens has been evaluating opportunities to lower costs and improve customer satisfaction of the STEP program since acquisition of the wastewater utility. Three primary areas were identified for "best value" program enhancements:

1. Customer Connection Rates - One of the largest issues with both the City's and Citizens' programs was that neither entity were highly effective getting property owners to connect to a new sewer, leaving costly infrastructure in the ground with limited use. Once a new sewer main is in place, the Marion County Health Department was the only agency with the authority to force property owners to abandon their septic systems and connect to the new sanitary sewer. As a result, historic connection rates typically ranged from 30–50% prior to enforcement by the Health Department.
2. Customer Satisfaction – Homeowners were required to coordinate lateral extensions using private contractors, and were required to complete the effort with limited assistance by the utility. The gravity sewer approach of main line installations often resulted in deep, open cut sewer installation, disrupting neighborhood traffic and requiring extensive site restoration.

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3. Cost - While STEP made providing sewer service more affordable to homeowners than Barrett Law projects, the cost born by the Utility increased significantly. Low pressure grinder pump systems offered a significant cost reduction and consistent approach across all STEP neighborhoods. Additionally, cost savings efforts were incorporated through design-build implementation and category management efforts.

As a result, significant revisions to the STEP program were incorporated in 2016 to better align with the goals and objectives of Citizens. Low pressure sewer systems became the primary method for providing sanitary sewer service. Low pressure

systems consist of shallow, small diameter lines; often times installed using trenchless technologies (Figure 2). A grinder pump package system is installed at each home to collect wastewater from the home and transport it through the low pressure collection system. In addition, Citizens assumed responsibility for installation of the grinder pump package, connection to the mainline, and abandonment of the existing septic system. A homeowner's responsibility was limited to a flat rate user fee of \$2,530 and a one-time permit fee of \$236, for a final cost of \$2,766 per connection.



Figure 2: Typical Low Pressure System

Homeowners who commit to connecting during the planning/design stages are offered two payment options: a one-time lump sum payment, or a 60 month, no interest payment plan. Once the property is connected, the homeowner assumes responsibility for operating and maintaining the system, including future grinder pump replacement if needed.

This approach provided a renewed focus on customer satisfaction and a number of value-added synergies. Limiting a homeowner's financial and logistical responsibilities has resulted in a staggering increase in voluntary connection rates to STEP projects, averaging over 98 percent STEP projects since 2016 as compared to the 40 to 50 percent prior to 2016. Though Citizens assumes a greater percentage of the overall project costs, the actual costs have decreased due to a number of factors, including:

- Compared to traditional gravity systems, low pressure systems are typically less expensive to construct due to the small diameter and shallow mainline installations. Construction is much less invasive and disruptive and requires less site restoration.
- Assuming responsibility for purchasing and installing the grinder pump systems allows Citizens to leverage our buying power and vendor relationships to obtain favorable pricing, resulting in project cost savings.
- Citizens' also began utilizing a modified design-build/category management approach to obtain cost savings through bundling projects, limiting detailed design /construction observation work, and reduced project schedules.

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- Operations and Maintenance (O&M) of a low pressure system is projected to be almost 20 percent less overall than O&M for a gravity system. This is primarily due to smaller plastic pipes that are continually cleaned under low pressure flows, and less future cleaning is required.

Another key item to note with respect to the 2016 STEP is the direct impact to the homeowner. As shown in Table 1, the cost to the homeowner has been reduced by more than 75 percent over the last 10 years. Furthermore, homeowners no longer have the stress and inconvenience of hiring a contractor to make their individual connection and abandon their septic system. As a result, Citizens has experienced a noticeable increase in public opinion towards the Utility and the program.

The new cost-saving measures discussed above have also resulted in a significant decrease in costs to Citizens for STEP projects since the Barrett Law Program. As the updated program continues to evolve and streamline operations, additional synergies will be recognized.

Table 1: Historic Program Costs

| | Barrett Law Program | STEP (2005 to 2016) | STEP (2016 to present) |
|--|---------------------|---------------------|------------------------|
| Typical Homeowner Costs | | | |
| Assessment (Mainline Construction) | \$10,000 | - | - |
| Typical Gravity Lateral Construction | \$4,000 | \$4,000 | - |
| Connection Fee/Permit | \$2,766 | \$2,766 | \$2,766 |
| Total Homeowner Cost | \$16,766 | \$6,766 | \$2,766 |
| Typical City of Indy/Citizens Energy Group Costs per Home | | | |
| Mainline Construction | \$15,000 | \$25,000 | \$11,000 |
| Grinder Pump Installation/Connection | - | - | \$5,000 |
| Total Utility Cost | \$15,000 | \$25,000 | \$16,000 |
| Total Cost | \$31,766 | \$31,766 | \$18,766 |

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Project Area Identification and Prioritization

Historical Methodology (pre-2016)

Prior to 2016, the prioritization of STEP project areas was done by Citizens staff with data compiled by Citizens and the Marion County Health and Hospital Corporation. Citizens then scheduled, designed, and constructed the projects prioritized within the plan. The prioritization system uses five weighted criteria to determine scores and rankings for each project. Each criterion was defined and scored on a scale from 0 - 5 and multiplied by the weighting factor (Table 2). The ranking order of these “priority projects” was modified based on the non-quantifiable factors described in Table 3.

Table 2: Historical Criteria for Prioritizing and Ranking STEP Projects

| Criteria | Weighting Factor | Criteria Explanation |
|----------------------------------|------------------|---|
| Septic Failure Rate | 5 | Percent of homes with failing septic systems within the project area, as determined by MCHH surveys. |
| Housing Density Factor | 5 | Estimated number of homes per acre within the project area. |
| Presence of Residential Wells | 3 | Percent of homes using private drinking water wells within the project area. |
| Presence of 100-Year Flood Plain | 3 | Percent of properties in the project area within or partially within the 100-year flood plain. |
| Wellfield Protection District | 1 | Percent of properties in the project area within or partially within a wellfield protection district. |

Table 3: Historical Non-Quantifiable Factors for STEP Project Selection

| Non-Quantifiable Factors | Reason/Logic |
|---|--|
| Overall Score without Septic Failure Rate | Engineering judgement was used to determine the likely results of a septic system failure rate survey for areas with incomplete data. |
| Density as Indicator for Septic Tank Failure Rate | High density areas typically indicate higher failure rate. Density was used to determine which project areas require MCHH surveys. |
| Downstream System Capacity Restriction | The project prioritization was lowered if the proposed project would result in capacity restrictions in the existing collection system. |
| Difficulty of Construction Based on Engineering Judgement | Prioritizing projects with respect to the ease of construction allowed the “easier to construct” projects to be completed first. |
| Cost per home | Prioritizing projects with a lower anticipated cost per home allows the available funds to be best utilized to address the highest number of homes earlier in the program. |

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Both the quantifiable and non-quantifiable factors were used to create a list of prioritized STEP projects in the historical program development. The prioritization was completed and the project areas were ranked as “priority projects” including approximately 7,500 homes in 115 project areas. These projects were then included in the 5-year program submitted annually to the Indiana Utility Regulatory Commission (IURC).

Current Methodology (post-2016)

In 2016, the Underground Engineering and Construction team (UE&C) within Citizens performed an in-depth review and update of the STEP project prioritization process. This effort is documented in the Project Planning, Prioritization, Methodology and Process (3PMAP) report. As part of the 3PMAP initiative, the criteria for prioritization and ranking were modified to provide a more consistent approach based on environmental impacts and overall program effectiveness. The modified criteria are summarized in Table 4.

Table 4: Modified Criteria for Prioritizing and Ranking STEP Projects

| Category | Weighting Factor | General Description | Score | Project Criteria | | | Units |
|---------------------------------------|------------------|--|-------|------------------|---|-------|------------|
| Housing Density Factor | 5 | Rates the project based on number of homes per acre. | 1 | 0.0 | - | 0.6 | homes/acre |
| | | | 3 | 0.61 | - | 1.5 | homes/acre |
| | | | 5 | 1.51 | < | | homes/acre |
| Category | Weighting Factor | General Description | Score | Project Criteria | | | Units |
| Presence of Residential Wells | 1 | Compares if a project on individual residential wells has water service available. | 0 | 0.0% | | | N/A |
| | | | 1 | 0.0% | - | 45.0% | Percent |
| | | | 3 | 45.01% | - | 85.0% | Percent |
| | | | 5 | 85.01% | > | | Percent |
| Category | Weighting Factor | General Description | Score | Project Criteria | | | Units |
| Presence of 100 yr Flood Plain | 1 | Compares if a project lies within 100 year flood plain. | 0 | 0.0% | | | N/A |
| | | | 1 | 0.1% | - | 15.0% | Percent |
| | | | 3 | 15.01% | - | 40.0% | Percent |
| | | | 5 | 40.01% | > | | Percent |

Housing density received the highest weighting due to the advantages of category management, and our ability to connect as many unsewered homes to the public sewer system as possible at the least capital cost. The focus on housing density also provides the greatest benefit to lower bacteria moving to receiving waterways from a high number of septic systems. For each criterion, scores from 0 -5 were used and the weighing factors were applied. The overall scores were categorized in ranges to determine high, medium and low severity rankings.

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In 2016, the concept of project “clustering” was also implemented as a cost-saving measure. A “cluster project” is defined as a lower-ranked project is combined with a higher-ranked project and completed together out of the prioritized order. Clustering projects are beneficial as work in an area is completed together lowering mobilization costs and wider spread disruption to neighborhoods. Additional quantitative cluster criteria factors were evaluated and refined to determine when projects should be clustered (Table 5).

Table 5: Enhanced Criteria for Clustering STEP Projects

| Criteria | Description | Reasoning | Conclusion/ Direction |
|---|---|--|---|
| Maximum 500 homes | Projects may be clustered provided the clustered areas do not exceed 500 homes. | The combined project would account for too large of a percentage of the annual program. | Do not cluster projects if combined project is more than 500 homes. |
| Offsite main extension <u>through</u> a lower ranked project area. | If the project requires an offsite main extension, and the extension will be constructed <u>through</u> , not adjacent to, a lower priority project. | Because the main will already be constructed within part of the lower-ranked area, and it can easily be extended throughout the area. Public discontent in the lower ranked area will likely be high if area is not included. The cost per home will likely be lower than if projects were constructed separately. | Include projects as a cluster. |
| Offsite main extension <u>adjacent</u> to a lower ranked project area | If the project requires an offsite main extension, and the extension will be constructed <u>adjacent</u> to a lower ranked project area. “Adjacent” means adjoining to, but not through, the priority project area or to the sewer extension. | If the lower-ranked project is defined as high density, it will likely have a lower cost per home, so it will be more cost-effective to cluster. If the lower-ranked project is defined as low or medium density, the higher cost per home can make the clustered project less cost-effective. | Include projects as a cluster if lower-ranked area is high density. Do not cluster if lower-ranked area is a low or medium density area. |
| Public interest | If there is a high public interest via email or call volume, acceleration of the project may be considered, but not guaranteed. | High public interest typically indicates engaged customers with strong opinions about the project. | If the public interest is in favor of the project, possibly consider advancing the project, unless it is a low density area at a significant cost per home. |

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Updated “High Priority” Homes

In November 1998, the Barrett Law Master Plan identified almost 18,000 unsewered “clustered” homes in Marion County considered priority for connection to sanitary sewer service (City of Indianapolis, 1998). Through 2017, 13,410 homes have been provided connections to the public sewer.

As part of our continuous improvement process, the UE&C team also reviewed the definition and designation of Priority homes. The key objectives of this review included:

- Confirming the updated prioritization criteria was consistently applied to the remaining identified STEP areas,
- Verifying that the “Priority” designation met the modified criteria, and
- Ensuring that the anticipated STEP funds are optimized to maximize the program impacts on the environment.

As documented in the 2017 3PMAP document, the driving criterion for reprioritizing STEP areas focuses on housing density, because this is an indicator of whether the working septic tanks have enough land for the effluent to be treated and drain properly, and if a failed septic tank poses a significantly higher risk to the public due to the relatively to other homes. A secondary emphasis was given to neighborhoods using private drinking water wells and those areas located within the 100-year flood plain. In reviewing the prioritized list of STEP areas, a natural distinction was noted in a subset of the “Priority” projects scoring highest in housing density and presence of drinking water wells or presence of the 100-year floodplain.

As a result, a new designation of “High Priority” is being used. This designation has been applied to the top 27 prioritized areas including contingent homes, resulting in approximately 3,000 homes remaining to be completed (Table 6). A contingent home is identified as open lots that may be developed by the 2025 timeframe from the list in Table 6, or other “High Priority” STEP areas that may evolve from strategic projects (i.e., sewer extensions, etc.). This category represents the opportunity to maximize available resources while achieving the best value of resulting environmental impacts for rate payers. Based on current target funding for the STEP program at approximately \$6M/year, the “High Priority” program is expected to conclude in 2025.

Customer Petitioning Process

The continuation of the STEP program beyond 2025 may be prudent for Citizens to consider, but a modification of the process is recommended. Further STEP implementation should be considered based on a customer petitioning process similar to the Barrett Law, but not as stringent and with higher involvement by Citizens in the process and implementation. The program team also recognizes that situations may arise that necessitate action sooner than predicted by the prioritization model. In situations such as these, it may be desirable to consider new STEP projects using the customer petitioning process.

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The following protocol to allow customers to petition Citizens to elevate their area on the program prioritization list:

- For project areas currently identified as “high priority” areas and programmed in the established timeframe through 2025, homeowners can request expediting the project. If 50 percent or more of the property owners petition in writing, Citizens will evaluate reprioritizing the project area.
- For project areas not identified as “high priority” areas or beyond 2025, homeowners can request reconsideration of their area by submitting proof of over 75 percent commitment from property owners. Citizens will then reevaluate the feasibility of providing service to that area, and the project area may be incorporated into the STEP program based on available capital funding.

Category Management

As part of our on-going continuous improvement and value engineering initiatives, Citizens is in the process of working towards optimizing the efficiencies and savings related to category management within STEP. The UE&C team is currently working with Citizens’ Supply Chain team to leverage the remaining STEP program through 2025 into multi-year packages related to design, materials purchasing, construction inspection/engineering, and construction. The result of this initiative will allow Citizens to optimize program savings while improving quality, ultimately providing a better overall value for rate payers while improving water quality throughout Indianapolis.

Table 6: High Priority STEP Projects through 2025

| Project Rank | Citizens Project Number | No. of Homes Verified | Density factor | Project Name | Weighted Scores | | | Total Score | Planning Estimate | Year |
|--------------|-------------------------|-----------------------|----------------|------------------------------------|------------------------|-------------------------------|--------------------------------|-------------|-------------------|----------|
| | | | | | 5 | 1 | 1 | | | |
| | | | | | Housing Density Factor | Presence of Residential Wells | Presence of 100 yr Flood Plain | | | |
| 1 | 92SP00555 | 221 | 1.70 | Rockville Road /High School Road 1 | 25 | 1 | 0 | 26 | \$ 3,536,000 | FY18 |
| 2 | 92SP02183 | 43 | 2.12 | 46th Street/ Binford Blvd | 25 | 5 | 5 | 35 | \$ 688,000 | FY18 |
| 3 | 92SP01652 | 465 | 1.84 | Thompson Road/ Meridian 2 | 25 | 5 | 3 | 33 | \$ 7,440,000 | FY18 -19 |
| 4 | 92SP02176 | 48 | 1.52 | 79th Street/ Keystone Avenue | 25 | 5 | 5 | 35 | \$ 768,000 | FY20 |
| 5 | 92SP02177 | 6 | 1.57 | 42nd Street/ German Church Road | 25 | 5 | 5 | 35 | \$ 96,000 | FY20 |
| 6 | 92SP02178 | 107 | 1.58 | 77th Street/ Dean Street | 25 | 3 | 5 | 33 | \$ 1,712,000 | FY20 |
| 7 | 92SP02111 | 61 | 2.77 | 72nd Street/ Westfield Blvd | 25 | 5 | 3 | 33 | \$ 976,000 | FY20 |

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| | | | | Weighted Scores | | | | | | | |
|--------------|-------------------------|-----------------------|----------------|---|------------------------|-------------------------------|--------------------------------|-------------|-------------------|-------------|--|
| | | | | Weighting Factors: | 5 | 1 | 1 | | | | |
| Project Rank | Citizens Project Number | No. of Homes Verified | Density factor | Project Name | Housing Density Factor | Presence of Residential Wells | Presence of 100 yr Flood Plain | Total Score | Planning Estimate | Year | |
| 8 | 92SP02179 | 18 | 2.09 | 21st Street/ Post Road | 25 | 1 | 5 | 31 | \$ 288,000 | FY20 | |
| 9 | 92SP02180 | 11 | 1.71 | 58th Street/ Stone Hill Dr | 25 | 1 | 5 | 31 | \$ 176,000 | FY20 | |
| 10 | 92SP02175 | 447 | 1.88 | 71st Street/ Tuxedo Ave | 25 | 3 | 3 | 31 | \$ 7,152,000 | FY20 -22 | |
| 11 | 92SP01649 | 55 | 3.21 | Millersville Road/Keystone Avenue | 25 | 1 | 5 | 31 | \$ 880,000 | FY22 | |
| 12 | 92SP02182 | 11 | 3.16 | Fleming Street/ Murray Street | 25 | 5 | 1 | 31 | \$ 176,000 | FY22 | |
| 13 | 92SP01640 | 117 | 2.93 | 69th Street/ Kingsley Drive | 25 | 0 | 5 | 30 | \$ 1,872,000 | FY22 | |
| 14 | 92SP00599 | 314 | 1.93 | 54th Street/ Riverview Dr | 25 | 0 | 5 | 30 | \$ 5,024,000 | FY22 -23 | |
| 15 | 92SP02184 | 8 | 2.25 | 70th Place/ College Avenue | 25 | 0 | 5 | 30 | \$ 128,000 | FY23 | |
| 16 | 92SP02181 | 131 | 1.77 | Troy Avenue/ Harding Street | 25 | 0 | 5 | 30 | \$ 2,096,000 | FY23 -24 | |
| 17 | 92SP01651 | 17 | 2.88 | 10th Street/ Devon Avenue | 25 | 0 | 5 | 30 | \$ 272,000 | FY24 | |
| 18 | 92SP02185 | 64 | 1.73 | Banta Road/ Bluffcrest Ct | 25 | 5 | 0 | 30 | \$ 1,024,000 | FY24 | |
| 19 | 92SP01650 | 15 | 1.72 | Routiers Ave/ 10th Street | 25 | 5 | 0 | 30 | \$ 240,000 | FY24 | |
| 20 | 92SP00317 | 84 | 1.65 | Mills Road/ Trotter Road | 25 | 5 | 0 | 30 | \$ 1,344,000 | FY24 | |
| 21 | Pending | 8 | 2.42 | Raceway Road/ Crossford Way | 25 | 5 | 0 | 30 | \$ 128,000 | FY24 | |
| 22 | 92SP02186 | 167 | 1.79 | 56th Street/ Fall Creek Pkwy | 25 | 5 | 0 | 30 | \$ 2,672,000 | FY24 -25 | |
| 23 | 92SP02187 | 16 | 1.90 | 27th Street/ Layman Ave | 25 | 5 | 0 | 30 | \$ 256,000 | FY25 | |
| 24 | 92SP02188 | 61 | 1.90 | Peachtree Lane/ Alige Ave | 25 | 5 | 0 | 30 | \$ 976,000 | FY25 | |
| 25 | 92SP02189 | 23 | 1.76 | Long Branch Drive/Frye Rd | 25 | 5 | 0 | 30 | \$ 368,000 | FY25 | |
| 26 | Pending | 37 | 1.54 | Franklin Road/ McGregor Rd | 25 | 5 | 0 | 30 | \$ 592,000 | FY25 | |
| 27 | Pending | 60 | 1.64 | 91st Street/ Tacoma Ave | 25 | 5 | 0 | 30 | \$ 960,000 | FY25 | |
| N/A | Contingent | 400 | N/A | N/A | N/A | N/A | N/A | N/A | \$ 6,400,000 | N/A | |
| N/A | TOTAL | 3,015 | N/A | N/A | N/A | N/A | N/A | N/A | \$ 48,240,000 | N/A | |

THIRTY NEIGHBORHOODS TO GET SEWERS IN NEXT THREE YEARS

City Ending Use of Barrett Law for Sewer Projects

The city's Clean Streams-Healthy Neighborhoods program will bring sewer service to 30 neighborhoods with failing septic systems during the next three years.

"Septic systems have a limited life and eventually fail," Mayor Bart Peterson said. "We will now be able to bring sewer service to homes, eliminate unhealthy conditions and ensure that their sewage gets high-level treatment."

Under the city's Septic Tank Elimination Program (STEP), the Department of Public Works (DPW) will replace failing septic systems with sanitary sewers in approximately 18,000 homes throughout Marion County by 2025. From 2006-2008, about 4,800 homes will be converted to sewers.

Projects planned in 2006 include the Bangor/Delaware neighborhood on the city's south side, which has suffered longstanding health and environmental concerns caused by septic systems.

In 1999, a Marion County Health Department survey found a 38 percent problem or failure rate of septic systems in Bangor/Delaware, including bleed outs, repairs, sewage backups and unsafe levels of *E. coli* bacteria in drainage ditches.

"*E. coli* and other potentially harmful bacteria that seep from failing septic systems are health hazards," said Anne Marie Smrchek, DPW project engineer. "The silt and clay soil in the Bangor/Delaware neighborhood is poor for septic waste absorption."

Resident John Carter, who built his home in Bangor/Delaware in 1963, has to pump his failed septic tank at least once a month.

"We've wanted to be connected to the sewers for so long," said Carter. "We'd be happy staying here forever if it weren't for the septic tank. During the winter and spring, you can smell the sewage in the neighborhood. It is embarrassing."

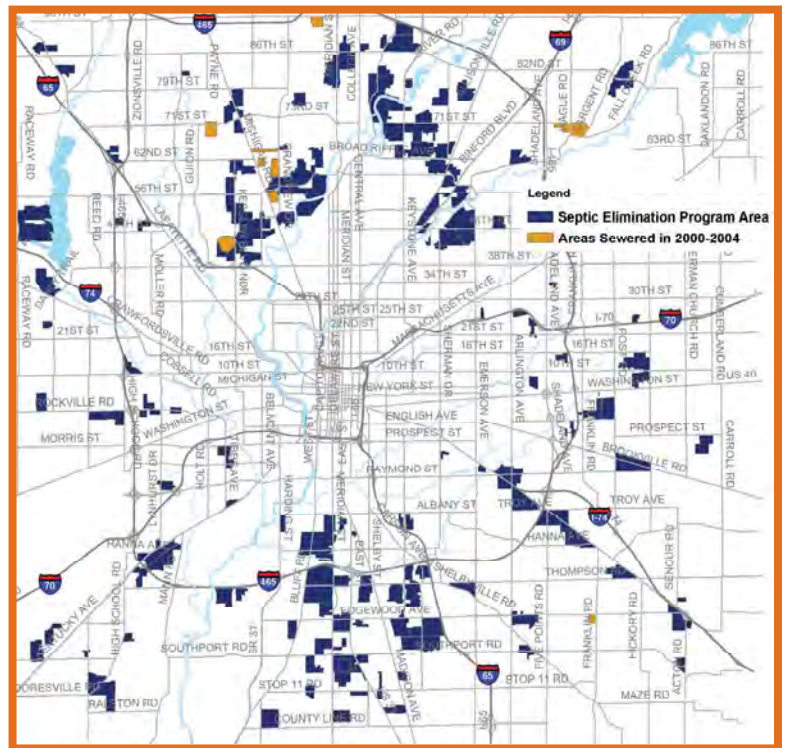
United Consulting Engineers, Inc., is the design engineer for the Bangor/Delaware project. Total project costs are estimated at \$11 million.

Under the new STEP program, the city will stop using the state's Barrett Law for all new septic conversion projects. Homeowners still will have to pay private property costs to connect to new sewers, including abandoning the septic tank, installing a lateral to the home, and a \$2,500 connection fee. However, the new policy is expected to cut the typical homeowner's total costs from \$11,000 to \$5,000. Actual costs will vary with each property.

For more information on the STEP program, visit our Web site at www.indycleanstreams.org. To find out when a neighborhood is scheduled to receive sewer service, go to <http://imaps.indy.gov/zoning>.



**A STEP TOWARD CLEANER STREAMS
AND HEALTHIER NEIGHBORHOODS.**



This map shows neighborhoods with 18,000 homes that have been targeted for sewer service in the next 20 years. Areas shown in orange were sewered in 2000-2004. The remaining neighborhoods will receive sewers by 2025. An additional 12,000 homes on septic systems will need to be addressed as the county grows and sewer service extends into the remaining rural areas.

ELIMINATING SEPTIC TANKS

In Indianapolis and Marion County, more than 25,000 homes are still served by private septic systems, which have a limited life and eventually fail. Septic systems can leach human waste into groundwater, backyards, neighborhood ditches and streams. The Septic Tank Elimination Program (STEP) dramatically improves water quality and also helps combat public health issues associated with poor water quality.

Since 2008, DPW has worked diligently to convert many neighborhoods on septic systems to the City sewer system.

The majority of STEP work was accomplished in 2009, 2010 and 2011 after Mayor Greg Ballard set a goal to complete 7,000 septic tank eliminations from 2009 to 2013. As of Aug. 25, 2011, approximately 3,300 connections had been completed.

DPW completed projects in the Franklin/Southeastern, Brill/Troy and Southeastern/Troy neighborhoods in 2009, 2010 and 2011 respectively. The projects completed were identified as a “high” priority, according to the City’s STEP Master Plan, which was updated in 2009. In the master plan, DPW categorized all projects as a “high,” “medium” or “low” priority based on 12 specific criteria, including but not limited to septic failure rate, presence of residential wells and petitions from residents or the Marion County Health Department.

Updates to the STEP Master Plan and standardization of internal engineering processes have allowed the City to make significant strides in STEP since 2008. Upon taking ownership of the wastewater utility, Citizens Energy Group plans to fulfill the mayor’s goal to transition 7,000 homes to the sanitary sewer.

The benefits of STEP improvements are far reaching: reduced health and environmental hazards, cleaner neighborhood streams and potential for improved property value when failing septic systems are abandoned.



“Eliminating raw sewage from backyards, ditches and streams is a tremendous public health benefit that extends beyond the boundaries of the neighborhood receiving the sewers.”

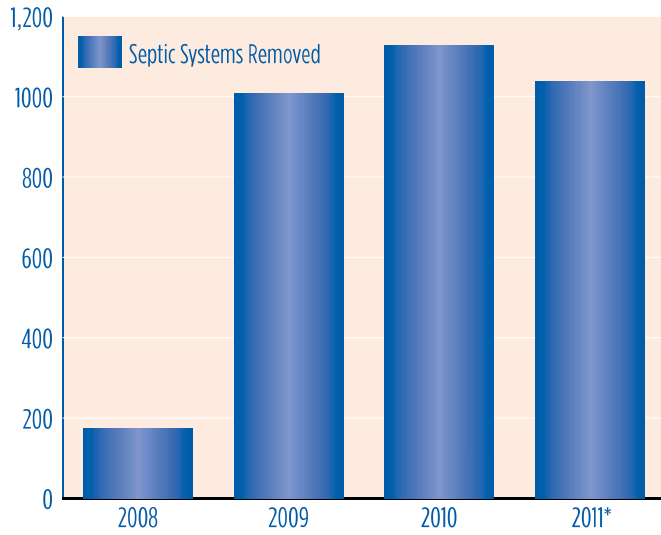
— Virginia A. Caine, M.D., director,
Marion County Public Health Department

Homeowner Responsibilities

Homeowners in STEP areas are responsible for three main costs:

- 1. Construction costs on private property.**
These costs include paying a licensed contractor to abandon the septic tank and install a lateral line that connects the home to the City sewer. Current costs for these services are approximately \$2,000 to \$2,500.
- 2. A sewer connection fee.**
Homeowners pay the sewer connection fee in one lump sum or over five years if they qualify for the City’s STEP Financial Assistance Plan. In 2011, the connection fee was \$2,530 and was adjusted annually based on the Consumer Pricing Index (CPI). Late in the year, the Indiana Utility Regulatory Commission (IURC) ruled that the fee will no longer be adjusted based on the CPI.
- 3. A monthly sewer bill.**
Currently, the sewer bill for an average home using 5,400 gallons a month is \$18.34 per month.

SEPTIC SYSTEMS REMOVED



*Septic systems removed in 2011 were completed from January through August 25.



Workers prepare to install new pipe for the Sunset and Kessler STEP project.



Construction continues on the Five Points and Southeastern STEP project.



Septic Tank Elimination Program (STEP)

More than 17,000 homes in Marion County are served by private septic systems. Septic systems have a limited life and eventually fail, leaching human waste into groundwater, backyards and neighborhood ditches and streams. Septic systems are linked to high E. coli bacteria counts in many small neighborhood streams and ditches during dry weather, when children are most likely to play in them.

The Solution

To address health hazards in our neighborhoods, Citizens Energy Group is continuing the city's efforts to convert many neighborhoods on septic systems to the sanitary sewer system.

Between 2009 and 2013, 7,000 homes in Indianapolis and Marion County have been or are planned to be taken off septic systems as part of STEP. Connecting these homes to the sanitary sewer will address approximately 25 percent of the homes on septic systems.

The Benefits

The benefits of STEP are far-reaching:

- Reduced health hazards from dangerous bacteria exposure due to septic system failures in yards and ditches

- Cleaner area streams and neighborhood drainage ditches
- Future cost savings for repair and/or replacement of septic system (estimated between \$3k - \$10k)
- Potential increased marketability of property

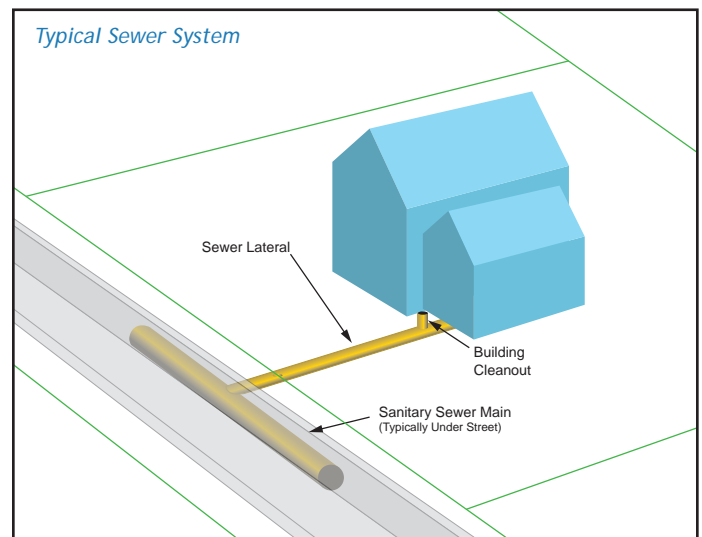
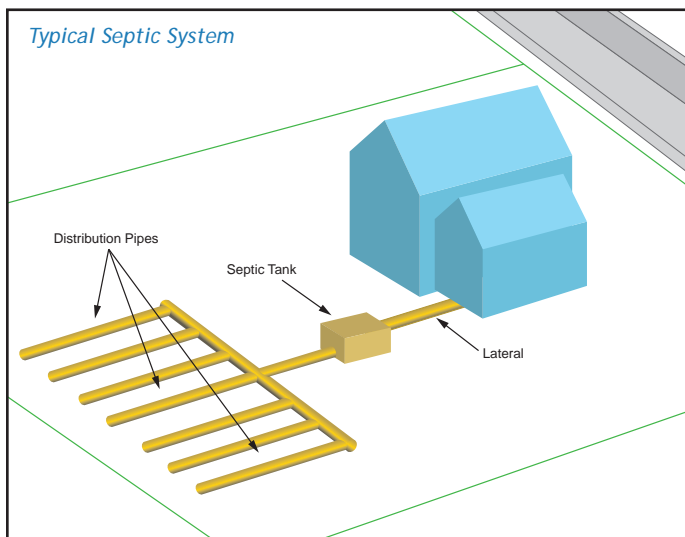
The Costs

In 2005, the city of Indianapolis stopped using the state's Barrett Law to construct sewers in areas with septic systems. The Barrett Law often forced homeowners to pay more than \$12,000 to connect to the sanitary sewer system. Instead, the city began funding STEP through wastewater rates. Today, Citizens is continuing the city's approach to STEP.

As a homeowner, there are three main costs to connect to the sewer:

1. Construction costs to abandon your septic tank and install a sewer lateral on your property to connect your home to the sanitary sewer. You must hire a licensed and bonded general contractor or plumber to perform the work, and costs for these services are approximately \$2,000 to \$5,000, but vary per property.

Continued on back.



2. A one-time connection fee of \$2,530 for single-family homes. The fee is paid in either one lump sum or over five years if the homeowner qualifies for the STEP Financial Assistance Plan.

Citizens requires the sewer connection fee and any other permitting fees and charges be paid before construction permits are issued.

If the connection fee is not included in your contractor's bid for the work (the other permitting fees and charges are typically included in contractor's bids), then you may pay the connection fee using one of the methods described in the section titled "How to Pay the Connection Fee."

3. Your monthly sewer bill, which you will receive from Citizens Energy Group, previously provided by Indianapolis Water.

Cash, personal checks and money orders are accepted, as well as Visa and MasterCard with a valid photo ID. Checks and money orders must be made payable to Citizens Energy Group.

2. Homeowners may also apply to participate in the STEP Financial Assistance Plan. Citizens Energy Group offers the Financial Assistance Plan to help lower-income residents in STEP project areas pay the connection fee over time. The Financial Assistance Plan only covers the connection fee and does not include the construction cost to abandon your septic tank and install your lateral. A resident with no dependents that has an annual gross household income at or below \$46,050 may be eligible for the plan. Additionally, residents will receive a credit of \$3,700 for each household dependent.

The Financial Assistance Plan is not a loan. It is an installment plan that allows qualified residents to pay \$50 per month, including administrative fees, over 60 months (five years).

To apply for the Financial Assistance Plan, call (317) 927-4328 and request an application.

Agencies Involved in STEP

Citizens constructs sewers in the public right-of-way, oversees STEP project implementation and the Financial Assistance Plan, which allows residents to pay the STEP connection fee in installments.

Citizens Energy Group will issue permits to licensed contractors to perform the necessary work on private properties to connect residents to the sewer system. *(Previously a function of the Department of Code Enforcement)*

The Marion County Health Department notifies property owners when they are required to connect to the sewer system and will enforce sewer connections.

How To Pay The Connection Fee

If the connection fee is not included in the contractor's estimate to connect your home to the sanitary sewer, homeowners may pay the connection fee to Citizens Energy Group directly by using one of the following methods:

1. Pay in person. If you choose this payment option, you must make arrangements with your contractor when you hire him or her to do the work. Make your payment in person at Citizens Energy Group, 2020 N. Meridian St., Indianapolis, IN 46202. Your contractor must have already applied for a permit before you make your payment. Permitting applications may be completed by your contractor online at www.CitizensEnergyGroup.com/Permits or by calling (317) 927-4328. A permit will not be issued until the connection fee is paid.



Typical Construction Area



Septic Tank Elimination Program (STEP)

Frequently Asked Questions

Septic Tank Elimination Program Basics

What is STEP?

STEP is Citizens Energy Group's program to extend sewers to areas currently served by a septic system.

How does STEP work?

Citizens constructs new sewers in neighborhoods as part of STEP and leaves a lateral stub for each property along the sewer route. When the sewers are complete, property owners abandon their septic tanks and install a pipe connecting the line from their home/business to the lateral stub provided by Citizens. Property owners pay a one-time connection fee and are responsible for private property construction costs associated with connecting their homes to the sanitary sewer. Citizens Energy Group is responsible for all construction costs within the public right-of-way, which includes the sewer main and the lateral stub to each property.

How does Citizens determine when my neighborhood gets sewers?

Projects are prioritized based on several criteria, three of which are: septic system failure rates, housing densities and proximity to a floodplain.

Paying for New Sewers

My property is scheduled for sewers next year. Does this new program mean I will get a free sewer?

No. You will need to hire a licensed and bonded general contractor or plumber to connect your home to the new sewer main, and you will be responsible for paying a connection fee before you can connect.

How much will the new sewers cost me?

As a homeowner, you have three main costs to connect to the sewer:

1. The construction costs on your property. The costs include hiring a contractor to abandon your septic

tank and install a sewer lateral from your home to the sewer main constructed by Citizens. Costs for these services are approximately \$2,000 to \$5,000 but vary by property.

2. A sewer connection fee. The current connection fee is \$2,530 for a single-family home. You pay the sewer connection fee in one lump sum or over five years if you qualify for the STEP Financial Assistance Plan.
3. Your monthly sewer bill.

How do I pay the connection fee?

Citizens Energy Group requires that the sewer connection fee and any other permitting fees and charges be paid before construction permits are issued. The connection fee must be paid before you can connect to the sewer system. If the connection fee is not included in your contractor's bid for the work (the other permitting fees and charges are typically included in contractors' bids), then you may pay the connection fee to Citizens Energy Group directly by using one of the methods described below.

1. Pay in person. If you choose this payment option, you must make arrangements with your contractor when you hire him or her to do the work. Make your payment in person at Citizens Energy Group, 2020 N. Meridian St., Indianapolis, IN 46202. Your contractor must have already applied for a permit before you make your payment. Permitting applications may be completed by your contractor online at www.CitizensEnergyGroup.com/Permits or by calling (317) 927-4328. A permit will not be issued until the connection fee is paid.

Cash, personal checks and money orders are accepted, as well as Visa and MasterCard with a valid photo ID. Checks and money orders must be made payable to Citizens Energy Group.

2. Homeowners may also apply to participate in the STEP Financial Assistance Plan. Citizens Energy Group offers the Financial Assistance Plan to help lower-income residents in STEP project areas pay the connection fee over time.

Continued on back.

What is the STEP Financial Assistance Plan, and how do I qualify?

The Financial Assistance Plan is not a loan. It is an installment plan that allows qualified residents to pay \$50 per month toward the connection fee and general administrative fees over 60 months (five years). The Financial Assistance Plan only covers the connection fee and does not include the construction cost to abandon your septic tank and install your lateral. A resident with no dependents that has an annual gross household income at or below \$46,050 may be eligible for the plan. Additionally, residents will receive a credit of \$3,700 for each household dependent. For more information on the Financial Assistance Plan or to request an application, call (317) 927-4328.

Connecting To The New Sewer

Can I connect to the sewer if and when I want to?

No. The Marion County Health Department requires you to connect to the new sewer system within six months of notice that the new sewers are ready for connection. You will receive a notice from Citizens Energy Group and the Marion County Health Department when you can connect. Chapter 14 of The Code of the Health and Hospital Corporation of Marion County mandates that any residential property within 100 feet of a sewer must connect.

My property is already connected to a sewer, yet Citizens is putting new sewers along my street. Will I have to connect to that new sewer?

It depends. If you are legally connected to a sanitary sewer and currently paying sewer user fees, your property may be exempt from connecting to the new sewer. However, if your connection is to an interceptor (one of the main sewer arteries) or you have no documentation of a legal connection, you may be required to connect to the new sewer. Required connections are reviewed on a case-by-case basis to ensure that connections meet Citizens Energy Group's standards.

I think my property is connected, but I have never received a sewer bill. What do I do?

A dye test of your property can be conducted to see if the property is connected to a sanitary sewer. If you are connected but not receiving a sewer bill, you will begin receiving a bill. Call (317) 927-4328 for more information.

If I am responsible for connecting my property, how do I arrange for the hookup?

You must hire a licensed and bonded general contractor or plumber to do the work. The Department of Code Enforcement keeps a list of licensed contractors which can be found at www.CitizensEnergyGroup.com/Contractors. Information on how to hire a licensed contractor will also be available at STEP public meetings.

Why can't Citizens connect my property to the sewer since it's already laying pipe in my neighborhood? Why does it stop at the right-of-way?

Citizens Energy Group does not provide this service because the connection would be on private property.

We own a duplex/double (both sides of a house/condo). Will we be allowed just one connection?

No. You will need a connection for both sides of the building. Citizens does not allow the sharing of laterals or connections, so one lateral stub is made available for each property that needs to connect. Two connection fees also will be charged since there are two units.

We recently remodeled our separate garage to create living quarters above it. Can we tap the garage into our house and have one connection?

No. You will need to connect each structure separately to the sewer. Citizens Energy Group standards do not allow common or shared laterals. Two connection fees also will be charged since there are two units.

For More Information

Visit www.CitizensEnergyGroup.com/STEP to learn more about connection fees, the Financial Assistance Plan, contractor costs and choosing a contractor. Call (317) 927-4328 for information on when Citizens will construct sewers in specific neighborhoods.



How to Hire a Contractor

Selecting a Contractor

Property owners are required to hire a licensed and bonded general contractor or plumber to connect their homes to Citizens Energy Group's sanitary sewer main. Since your Septic Tank Elimination Program (STEP) project affects your entire neighborhood, you and your neighbors are likely to be approached by many contractors soliciting work. Selecting a contractor is an issue that should not be handled lightly, as you are responsible for paying for their services.

Consider the following when selecting a general contractor or plumber:

1. Ask the contractor for a business card. The card should include the company's name, address and phone number.
2. Research the contractor.
 - Make sure the general contractor or plumber is licensed with the City of Indianapolis. Call (317) 327-8700 or visit www.citizensenergygroup.com/Contractor for a link to the Indianapolis Department of Code Enforcement (DCE) website to determine if the contractor is licensed.
 - Make sure the contractor is bonded.
 - Ask the contractor for the name and phone number of his or her insurance company.
 - Verify with the insurance company that the contractor is insured against claims covering workers' compensation, property damage and personal liability claims.
 - Contact the local Better Business Bureau at (317) 488-2222 (Website: www.indybbb.org; email: info@indybbb.org) to find out if there have been complaints about the contractor.
 - Contact the Office of the Attorney General, Consumer Services Division, at (317) 232- 6330 (Website: www.in.gov/attorneygeneral) and ask how long the company has been in business and if any complaints have been filed against it.
 - Contact Angie's List at 1-888-944-5478 or visit

www.angieslist.com. Angie's List is a membership organization that requires a yearly fee to use the service.

3. Talk with your neighbors, friends and co-workers who might have experience with local contractors. Ask them if they have recommendations.
4. Ask the contractor for a list of local references, including names and phone numbers. Call the references to find out if they were satisfied with the contractor's work. Visit and inspect the projects.
5. Ask for estimates in writing from at least two or three contractors. Estimates should be provided free of charge. Compare costs before making a financial commitment. Make sure the estimates are based upon the same specifications, materials, labor and time. Also, if you coordinate with several of your neighbors, the contractor may reduce the price.
6. Discuss the estimates in detail with each contractor, making certain you understand the reasons for any variations in the prices. The lowest estimate is not always the best estimate.

Signing a Contract

Before signing a contract, make sure all the necessary components are listed, including but not limited to the following:

1. Any contracts you sign should have the name of the company, the name of the contractor's representative, the company's address and its telephone number. Never sign a partial or blank contract. Read every contract clause carefully, and ask any questions you may have before signing. Retain a copy of the signed contract and file it in your records.
2. You are not required to make a down payment for lateral connections; it is your choice. Be suspicious if you are asked to pay for the entire job in advance. The down payment, as a rule of thumb, is usually no

Continued on back.

more than one-third of the total contract price.

3. Be sure the contractor includes a list of all work to be completed. The contract you sign must include, at a minimum, the following:
 - Abandoning the septic tank
 - Pumping and emptying the septic tank
 - Disposing of the sludge at a Citizens Energy Group treatment plant (Note: Disposal of sludge in the new sewer is against the law.)
 - Filling all tanks with clean fill material to grade level
 - Any internal plumbing changes necessary to connect to the sanitary sewer
 - A complete plumbing connection to ensure your lateral is connected directly to the sanitary sewer main
 - Connecting all wastewater lines, including the washing machine line, to the lateral that runs to the sanitary sewer
 - Agreed-upon start and completion dates
 - Any warranties and guarantees of workmanship
 - All verbal promises made during your hiring process
4. Other information that may be included in the contract:
 - Final grading and filling in voids in your yard after settlement
 - Driveway restoration and any landscape restoration
 - Total cost, with a breakdown for labor and material charges
 - A payment schedule
 - Property-specific requirements unique to the location
5. If the contractor's work does not pass inspection, you should not be held financially responsible for any corrections that must be made.
6. Make sure you inform your contractor of all known stormwater and perimeter lines. It is illegal to connect lines that discharge stormwater, groundwater, roof runoff, subsurface drainage or surface water into the sanitary sewer (such as sump pumps, downspouts, etc.).
7. Do not sign a completion certificate for the job until it has been inspected and approved by DCE inspectors and all work specified in your contract is properly completed.



Grinder Pump Frequently Asked Questions

What is a grinder pump?

A grinder pump is a pumping unit consisting of a pump and small pipe from the unit to the sewer system. Installed outside of your home, grinder pumps are used to discharge wastewater from your home to the sewer system in the street or right-of-way.

When is a grinder pump installed instead of a traditional sewer lateral?

A grinder pump is needed when conventional gravity sewers and/or laterals cannot be used to service an area or property, often due to the topography of the area. Typically, they are needed when a home is lower than the street and/or further away from the sewers. They are also required when a low pressure sewer system is constructed instead of a gravity sewer system.

Why does my property need a grinder pump when my neighbor's property can be served by gravity sewers?

Your home may either sit lower than your neighbor's, or further away from the gravity sewer in the street and could not be served by a gravity sewer/lateral. Each home is evaluated on an individual basis.

How much does it cost to install a grinder pump

The average cost for installing the grinder pump is approximately \$4,000-\$5,000, but varies per property. The cost for electricity to the grinder pump is similar to that of a 40-watt light bulb, which is about \$15 to \$20 per year. This is in addition to the connection fee of \$2,530.

Does a grinder pump need regular maintenance or need to be pumped out, like my septic system?

Septic systems need to be pumped because they are tanks and need to periodically have the contents removed. Grinder pumps do not need to be pumped out because they pump out the wastewater once the contents reach a certain level. Grinder pumps average eight years between service calls, so minimal regular maintenance is required when operated under normal conditions.

What happens during a power failure?

If the power goes out, the grinder pump and its alarm system will not work because they both require electricity. However, the pump unit does have storage capacity.

During power outages, the two largest producers of wastewater (dishwater and washing machine) are not in use; therefore, your water usage decreases. Because the length of the power outage cannot be planned, you should conserve water to the best of your ability.

How big is the grinder pump, and what does it look like?

There will only be two parts of the pump above the ground: the alarm panel and lid. The alarm panel is enclosed in a small weatherproof box so that it can be accessed easily. The grinder pump lid is about 26 inches in diameter and rises approximately 2 inches above the ground. The lid can be painted and/or hidden by plants.



*Grinder Pump
(pre-installation)*

My septic tank sometimes has an odor. Will the grinder pump also produce an odor?

No. When wastewater sits, as it does in a septic system, it becomes septic and produces a distinctive odor. Since the grinder pump will remove wastewater by pumping it into the sewer system, you should not notice any odor.



Surface View (post-installation)

Agencies Involved in STEP

Citizens will construct sewers in the public right-of-way, oversees STEP project implementation and the STEP installment payments plan.

The Marion County Health Department notifies property owners when they are required to connect to the sewer system and will enforce sewer connections.

For detailed information regarding fees, please visit: www.CitizensEnergyGroup.com/Notices for the Wastewater Terms and Conditions.



Grinder pump being installed. This view shows the trenching required for a typical installation.



Above: Directional boring machines allow pipe to be installed under streets without the disruptive street cutting and excavation.



Here is a view of the grinder pump in the trench. This is prior to piping, refilling the trench with soil and leveling of the site.



Above: Street view of a typical STEP construction site.



Septic Tank Elimination Program (STEP) Guide

The Problem

More than 17,000 homes in Marion County are served by private septic systems. Septic systems have a limited life and eventually fail, seeping human waste into groundwater, backyards and neighborhood ditches and streams. Septic systems are linked to high E. coli bacteria counts in many small neighborhood streams and ditches during dry weather when children are most likely to play in them.

The Solution

To address health hazards in our neighborhoods, Citizens Energy Group is continuing the City of Indianapolis' efforts to convert many neighborhoods on septic systems to the sanitary sewer system.

The Benefits

The benefits of STEP are far-reaching:

- Reduced health hazards from dangerous bacteria exposure due to septic system failures in yards and ditches
- Cleaner area streams and neighborhood drainage ditches
- Future cost savings for repair and/or replacement of septic system (estimated between \$3k - \$10k)
- Potential increased marketability of property
- STEP helps Citizens comply with a federal mandate to virtually eliminate discharges of raw sewage to area rivers and streams by the year 2025

The Costs

In 2005, the City of Indianapolis stopped using the State's Barrett Law to construct sewers in areas with septic systems. The Barrett Law often forced property owners to pay more than \$12,000 to connect to the sanitary sewer system. Instead, the City began funding STEP through wastewater rates. Today, Citizens is continuing

the City's approach to STEP and has made significant advancements in reducing the cost to property owners.

In 2016, Citizens adopted a new approach to providing sewer service to properties currently being served by septic systems. As part of this new program, property owners will be able to pay one fee for connection and construction; to one entity (i.e. Citizens Energy Group) if they agree to participate in our program within the allotted time. (*Offer is only good for a limited time. See Substantially Complete Offer section for more details.)

As a property owner, there are two main costs to connect to the sewer under the 30-Day Offer (See STEP Enrollment Agreement for specific details):

1. Citizens will be responsible for constructing the sewer system, including the lateral connection to your home, abandoning your septic system and installing a low-pressure system (i.e. grinder pump).

Option A - The cost to property owners for this project is \$2,766 per single-family home. This includes the connection fee and related construction costs. The property owner agrees to pay for this in one lump sum

Option B - Opt for the installment plan in which the property owner would be responsible for making sixty (60) equal monthly payments of \$46.10 for a total of \$2,766

2. Your monthly sewer bill, which you will receive from Citizens Energy Group, previously provided by Indianapolis Water.

If property owner elects to secure their own contractor to construct the lateral, abandon their septic tank and install the grinder pump, Citizens still requires the sewer connection fee (\$2,530) and any other permitting fees and charges be paid before construction permits are issued. Once required fees have been paid, a grinder pump will still be provided.

Please note: The payment plan option will not be available to property owners not participating in Citizens installation program. Therefore, all fees must be paid in a lump sum payment.

Continued on next page

How To Enroll

1. Complete the Septic Tank Elimination Program (STEP) Enrollment Agreement - This agreement outlines specific details of the work Citizens and/or its contractor(s) will perform to connect your property to the sewer system; access you will need to grant; payment options and other important details related to the program. Agreements must be submitted in person or by mail by the deadline contained on the agreement.
2. Whether you indicate Option A or B for payment on the Enrollment Agreement, you will either be receiving instructions from Citizens regarding your lump sum payment, or your required monthly payment will appear on your sewer bill once your service is connected.
3. If you have questions regarding enrollment or the agreement, please call 317-927-4444 and select the option for Wastewater Permitting/STEP Inquiries.

* Please note: If you are or are planning to sell your property, you must disclose participation in a STEP project.

** Neither Citizens, nor our contractors will ever come door-to-door to request payment for STEP.

What If I Miss the 30-Day Offer Enrollment Deadline?

From the date of the last public meeting for your project area, you can opt to participate in Citizens 30-Day Offer. However, if you miss that deadline, but would still like to participate in the program, you may elect to take advantage of the Substantially Complete Offer. The specific details of this offer are outlined in the STEP Enrollment Agreement, but essentially it requires you to pay an additional \$500 fee,* a direct pass-through cost to Citizens contractor, before the substantial completion date outlined in your enrollment agreement in order to participate in the program.

*The \$500 fee must be paid upfront and separately from your enrollment costs of \$2,766. Payment cannot be made in installments.

What's Changed with STEP

Besides the new lower cost of STEP and the ability for property owners to have Citizens handle the related construction, connections will primarily be to a low-pressure sewer system.

What is a Low-Pressure System

- Low-pressure systems require a pumping unit (i.e. grinder pump) at each property
- Grinder pumps are connected to a smaller diameter sewer in the public right-of-way (i.e. street)
 - Sewer under "low pressure"
 - Eventually, the small diameter pipe connects to a gravity sewer system to be carried to the treatment plant
- Requires a control/alarm box on the house to alert property owner of any issues
- Requires a valve pit at the property line similar to a water meter pit

Frequently Asked Questions Regarding Grinder Pumps

What is a grinder pump?

A grinder pump is a pumping unit consisting of a pump and small pipe from the unit to the sewer system. Installed outside of your home, grinder pumps are used to discharge wastewater from your home to the sewer system in the street or right-of-way.

Does a grinder pump need regular maintenance or need to be pumped out, like my septic system?

Septic systems need to be pumped because they are tanks and need to periodically have the contents removed. Grinder pumps do not need to be pumped out because they pump out the sewage once the contents reach a certain level. Grinder pumps average eight years between service calls, so minimal regular maintenance is required when operated under normal conditions.

How long will my grinder pump last and what does it cost to fix/replace it?

If properly maintained, the average life of a grinder

pump is 20 years. Each pump comes with a standard two-year parts and labor warranty. On average, the cost to replace a grinder pump is around \$2,500.

What are the electrical requirements for operating the grinder pump?

For optimal performance, 240 volt 1 phase 30 amp service is best, but 20 amp is acceptable. The cost for electricity to the grinder pump is similar to that of a 40-watt light bulb, which is about \$15 to \$20 per year.

What happens during a power failure?

If the power goes out, the grinder pump and its alarm system will not work because they both require electricity. However, the pump unit does have storage capacity.

During power outages, the two largest producers of wastewater, dishwashers and washing machines, are not in use; therefore, your water usage decreases. Because the length of the power outage cannot be planned, you should conserve water to the best of your ability. In some cases, a panel with a generator receptacle and auto-transfer switch are available on the pump.

How big is the grinder pump, and what does it look like?

There will only be two parts of the pump above the ground: the alarm panel and lid. The alarm panel is enclosed in a small weatherproof box so that it can be accessed easily. The grinder pump lid is about 26 inches in diameter and rises approximately 2 inches above the ground. The lid can be painted and/or hidden by plants.



Illustration courtesy Carolina Lift Stations



Cross-section of Grinder Pump (Pre-installation)



Surface View of the Grinder Pump (post-installation)

My septic tank sometimes has an odor. Will the grinder pump also produce an odor?

No. When wastewater sits, as it does in a septic system, it becomes septic and produces a distinctive odor. Since the grinder pump will remove wastewater by pumping it into the sewer system, you should not notice any odor.



Earlham Drive/Thompson Road STEP Project

Citizens Energy Group is working to replace failing septic systems with sanitary sewers in the Earlham Drive/Thompson Road area on the city's southeast side as part of the Septic Tank Elimination Program (STEP).

The Problem

Septic systems have a limited life and eventually fail. In addition, the soil types in Marion County are poor for septic waste absorption. As a result, human waste leaches into groundwater, backyards and neighborhood ditches and streams. Failing septic systems are linked to unsafe levels of E. coli in many neighborhood streams and ditches.

The Solution

Approximately 100 properties are part of the Earlham Drive/Thompson Road project, as shown on the map on the reverse side. This project will include the installation of new sanitary sewers.

To address health hazards in our neighborhoods, the Septic Tank Elimination Program (STEP) was implemented to convert many neighborhoods on septic systems to the sanitary sewer system. STEP will bring sewers to hundreds of homes annually to address a majority of the approximately 25,000 Indianapolis homes still on septic systems. Projects are prioritized based on several criteria, three of which are septic system failure rates, housing densities and proximity to a floodplain.

How You Can Help

Everyone has a role in protecting our waterways. You can help by adopting the following environmentally friendly practices:

- Disconnect downspouts and sump pumps connected to the sewer system. Their flow takes up capacity we need to carry sewage.
- Don't send fats, oils and grease down the drain.

They can clog our sewers and cause overflows and costly repairs.

- Clear gutters and storm sewer drains of leaves and debris.
- Never dispose motor oil, antifreeze, battery acid and household chemicals down the drain. Properly dispose of these materials through the city's ToxDrop program. Log on to www.sustainindy.org/ToxDrop to learn how.
- Reduce water use in your homes and businesses.
- Sign up to receive e-mail warnings of sewer overflows at www.citizensenergygroup.com.
- Pick up your pet's waste. It can end up in our waterways.
- Reduce or eliminate insecticide, herbicide and fertilizer use. These chemicals also can end up in our waterways.

Project Status

Project Status: In Design

Anticipated Construction Period: Spring 2015 to Winter 2015

Designer: Burgess & Niple

Estimated Project Costs: \$2.5 million

Approximate Number of Properties In The Project: 100

Project Manager: Aaron Goslee,
agoslee@citizensenergygroup.com, 317-341-3794

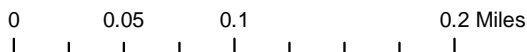
STEP Information Line: 317-927-4328

Marion County Health Department: Mike Goodin,
317-221-2147

Project Schedules And Costs Are Subject To Change.

Continued on back.

Earlham Drive - Thompson Road STEP Project #92SP00390 . BL-39-007





75th Street/Keystone Avenue STEP Project

Citizens Energy Group is working to replace failing septic systems with sanitary sewers in the 75th Street/Keystone Avenue area on the city's northeast side as part of the Septic Tank Elimination Program (STEP).

The Problem

Septic systems have a limited life and eventually fail. In addition, the soil types in Marion County are poor for septic waste absorption. As a result, human waste leaches into groundwater, backyards and neighborhood ditches and streams. Failing septic systems are linked to unsafe levels of E. coli in many neighborhood streams and ditches.

The Solution

Approximately 428 properties are part of the 75th Street/Keystone Avenue project, as shown on the map on the reverse side. This project will include the installation of new sanitary sewers.

To address health hazards in our neighborhoods, the Septic Tank Elimination Program (STEP) was implemented to convert many neighborhoods on septic systems to the sanitary sewer system. STEP will bring sewers to hundreds of homes annually to address a majority of the approximately 25,000 Indianapolis homes still on septic systems. Projects are prioritized based on several criteria, three of which are septic system failure rates, housing densities and proximity to a floodplain.

How You Can Help

Everyone has a role in protecting our waterways. You can help by adopting the following environmentally friendly practices:

- Disconnect downspouts and sump pumps connected to the sewer system. Their flow takes up capacity we need to carry sewage.
- Don't send fats, oils and grease down the drain.

They can clog our sewers and cause overflows and costly repairs.

- Clear gutters and storm sewer drains of leaves and debris.
- Never dispose motor oil, antifreeze, battery acid and household chemicals down the drain. Properly dispose of these materials through the city's ToxDrop program. Log on to www.sustainindy.org/ToxDrop to learn how.
- Reduce water use in your homes and businesses.
- Sign up to receive e-mail warnings of sewer overflows at www.citizensenergygroup.com.
- Pick up your pet's waste. It can end up in our waterways.
- Reduce or eliminate insecticide, herbicide and fertilizer use. These chemicals also can end up in our waterways.

Project Status

Project Status: In Design

Anticipated Construction Period: Spring of 2016

Designer/Builder: Miller Pipeline, LLC

Estimated Project Costs: \$6.5 million

Approximate Number of Properties In The Project: 428

Project Manager: David Clark, dclark@citizensenergygroup.com 317-429-3993

STEP Information Line: 317-927-4328

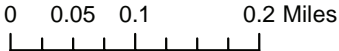
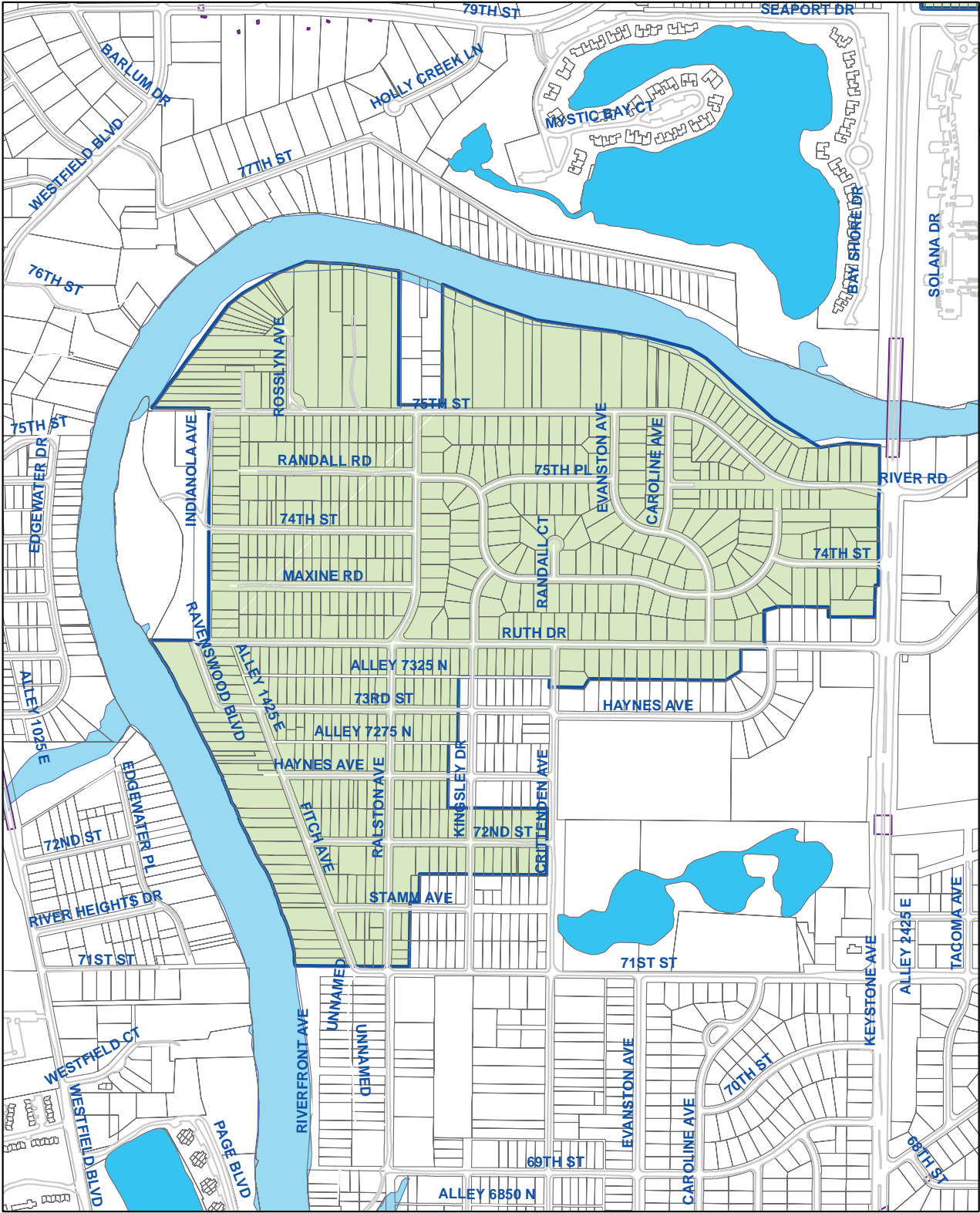
Marion County Health Department: Jason Ravencroft, 317-221-2147

Project Schedules And Costs Are Subject To Change.

Continued on back.

75th St. - Keystone Ave. STEP

92SP00726/BL-04-009





82nd Street and Westfield Boulevard STEP Program

Citizens Energy Group is working to replace failing septic systems with sanitary sewers in the 82nd Street/Westfield Boulevard area on the city's northeast side as part of the Septic Tank Elimination Program (STEP).

The Problem

Septic systems have a limited life and eventually fail. In addition, the soil types in Marion County are poor for septic waste absorption. As a result, human waste seeps into groundwater, backyards and neighborhood ditches and streams. Failing septic systems are linked to unsafe levels of E. coli in many neighborhood streams and ditches.

The Solution

Approximately 250 properties are part of the 82nd Street/Westfield Boulevard project, as shown on the map on the reverse side. This project will include the installation of new sanitary sewers.

To address health hazards in our neighborhoods, the Septic Tank Elimination Program (STEP) was implemented to convert many neighborhoods on septic systems to the sanitary sewer system. STEP will bring sewers to hundreds of homes annually to address a majority of the approximately 25,000 Indianapolis homes still on septic systems. Projects are prioritized based on several criteria, three of which are septic system failure rates, housing densities and proximity to a floodplain.

How You Can Help

Everyone has a role in protecting our waterways. You can help by adopting the following environmentally friendly practices:

- Disconnect downspouts and sump pumps connected to the sewer system. Their flow takes up capacity we need to carry sewage.
- Don't send fats, oils and grease down the drain.

They can clog our sewers and cause overflows and costly repairs.

- Clear gutters and storm sewer drains of leaves and debris.
- Never dispose motor oil, antifreeze, battery acid and household chemicals down the drain. Properly dispose of these materials through the city's ToxDrop program. Log on to www.sustainindy.org/ToxDrop to learn how.
- Reduce water use in your homes and businesses.
- Sign up to receive e-mail warnings of sewer overflows at www.citizensenergygroup.com.
- Pick up your pet's waste. It can end up in our waterways.
- Reduce or eliminate insecticide, herbicide and fertilizer use. These chemicals also can end up in our waterways.

Project Status

Project Status: In Construction

Anticipated Construction Period: Fall 2016 -Summer 2017

Design - Build Contractor: Miller Pipeline, LLC

Estimated Project Costs: \$5.6 million

Approximate Number of Properties In The Project: 250

Project Manager: David Clark, DClark@CitizensEnergyGroup.com, 317-429-3993

STEP Information Line: 317-927-4328

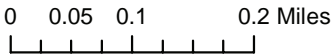
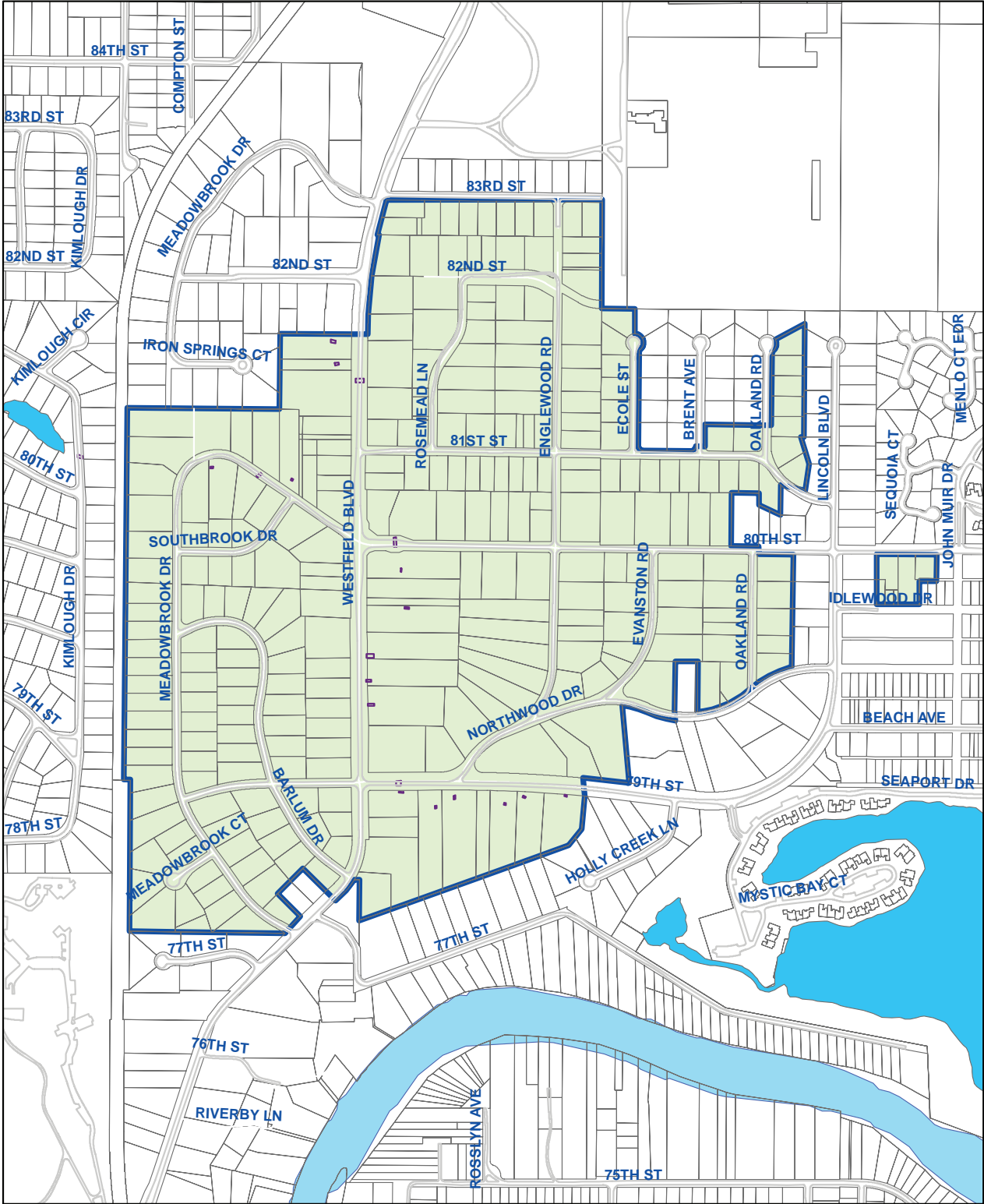
Marion County Health Department: Jason Ravenscroft, 317-221-2147

Project Schedules And Costs Are Subject To Change.

Continued on back.

82nd St. - Westfield STEP

92SP00794/BL-11-002F





46th Street and Binford Boulevard STEP Project

Citizens Energy Group is working to replace failing septic systems with sanitary sewers in the 46th Street/Binford Boulevard area on the city's northeast side as part of the Septic Tank Elimination Program (STEP).

The Problem

More than 17,000 homes in Marion County are served by private septic systems. Septic systems have a limited life and eventually fail, seeping human waste into groundwater, backyards and neighborhood ditches and streams. Septic systems are linked to high E. coli bacteria counts in many small neighborhood streams and ditches during dry weather when children are most likely to play in them.

The Solution

Approximately 37 properties are part of the 46th Street/Binford Boulevard project, as shown on the map on the reverse side. This project will include the installation of new sanitary sewers.

To address health hazards in our neighborhoods, the Septic Tank Elimination Program (STEP) was implemented to convert many neighborhoods on septic systems to the sanitary sewer system. STEP will bring sewers to hundreds of homes annually to address a majority of the approximately 17,000 Indianapolis homes still on septic systems. Projects are prioritized based on several criteria, three of which are presence of drinking water wells, housing densities and proximity to a floodplain.

How You Can Help

Everyone has a role in protecting our waterways. You can help by adopting the following environmentally friendly practices:

- Disconnect downspouts and sump pumps connected to the sewer system. Their flow takes up capacity we need to carry sewage.

- Don't send fats, oils and grease down the drain. They can clog our sewers and cause overflows and costly repairs.
- Clear gutters and storm sewer drains of leaves and debris.
- Never dispose motor oil, antifreeze, battery acid and household chemicals down the drain. Properly dispose of these materials through the city's ToxDrop program. Log on to www.sustainindy.org/ToxDrop to learn how.
- Reduce water use in your homes and businesses.
- Sign up to receive e-mail warnings of sewer overflows at www.citizensenergygroup.com.
- Pick up your pet's waste. It can end up in our waterways.
- Reduce or eliminate insecticide, herbicide and fertilizer use. These chemicals also can end up in our waterways.

Project Status

Anticipated Construction Period: Spring 2018 - Fall 2018

Contractor: Miller Pipeline, LLC

Estimated Project Costs: \$900,000

Approximate Number of Properties In The Project: 37

Construction Manager: Jamie Schultz,
JSchultz@ CitizensEnergyGroup.com,
317-429-3929

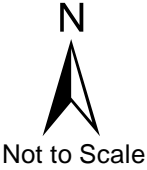
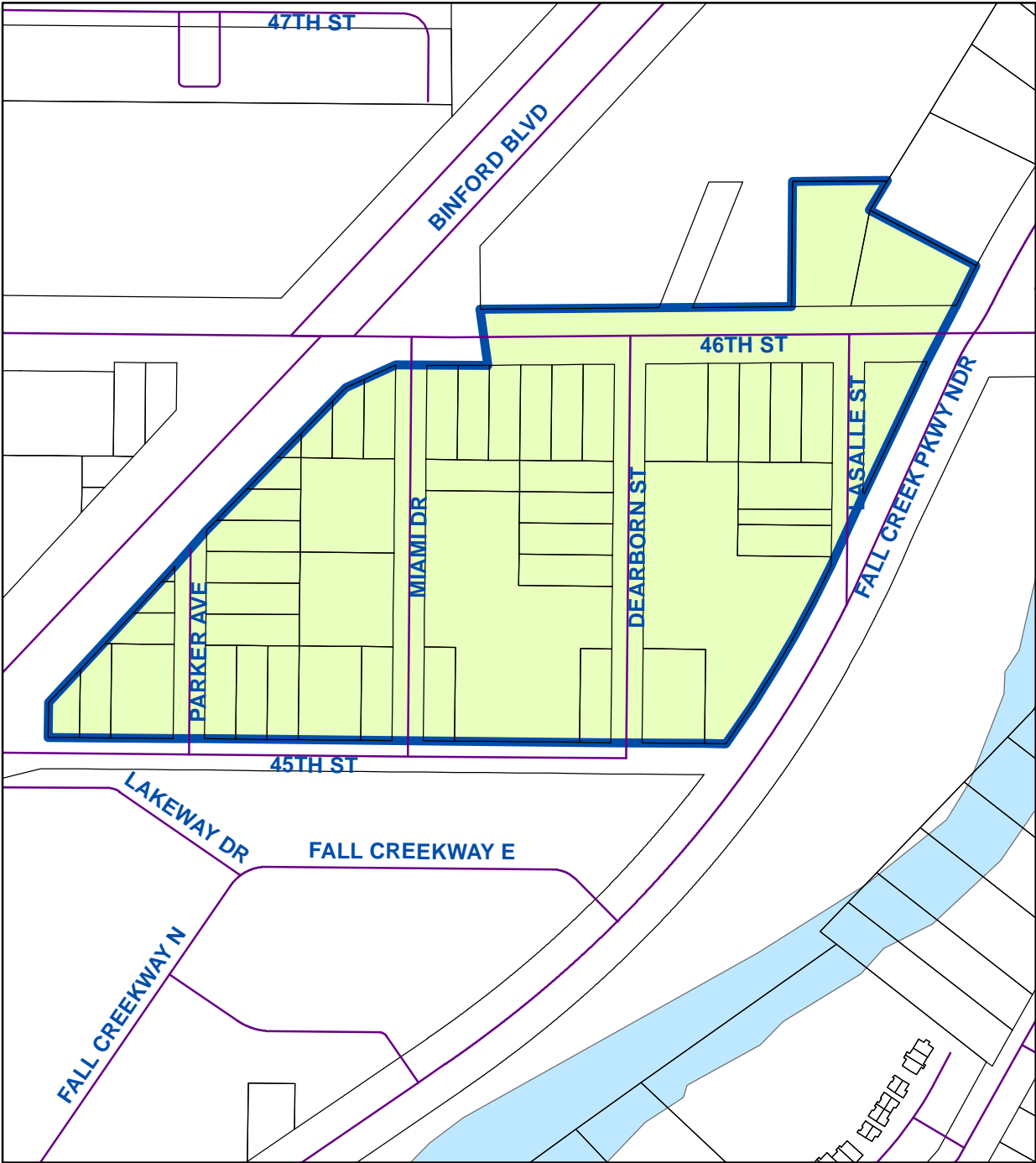
Enrollment Questions: 317-927-4444

Marion County Health Department: Jason Ravenscroft,
317-221-2147

Project Schedules And Costs Are Subject To Change.

Continued on back.

46th Street - Binford Boulevard STEP 92SP02183



Athens Utilities Board

| | |
|---|----------------------------------|
| Division of Wastewater – Policies and Procedures Manual Standard Policies and Procedures | |
| Policy Number – AUB-02-04a | Revision Number: 5 |
| Subject Wastewater Asset Responsibility | Effective Date: 7/01/13 |
| | Superintendent Approval: |
| | General Manager Approval: |

1.0 PURPOSE AND SCOPE

The purpose of this policy is to outline the responsibilities of the Athens Utilities Board (AUB) in regards to line obstructions and maintenance. This policy applies to all wastewater accounts serviced by AUB.

2.0 REFERENCES

AUB Wastewater Division Policy AUB-02-01, Prohibitions and Limitations on Wastewater Discharges
AUB Wastewater Division Policy AUB-02-05, Wastewater Tap Policy and Fee

3.0 GENERAL

AUB operates an ongoing maintenance and rehabilitation program with the directive to eliminate inflow and infiltration (I/I) and to minimize collection system obstructions and stop-ups.

AUB will maintain the wastewater collection system and will correct any obstructions within the AUB system. Customers shall be responsible for any maintenance and/or obstruction in their service line.

4.0 DEFINITIONS

AUB – the Athens Utilities Board, and its duly authorized employees, agents, and representatives **Board** – the Chairman and all Commissioners but does not include any employees

Local Control Authority – Superintendent of Water and Wastewater or duly authorized representative

Customer – any person discharging waste to AUB’s Wastewater Collection System and wastewater treatment facilities

WWTP – Wastewater Treatment Plant, facilities owned and operated by AUB

5.0 POLICY/PROCEDURES

AUB’s gravity wastewater collection system includes mains and service lines from the tap to AUB’s clean-out which is located in a right-of-way or easement as illustrated in *Figure 1*. AUB’s low pressure force main system includes mains, low pressure force mains and grinder pump assemblies. AUB’s responsibility begins at the inlet side of the grinder pump.

If collection system obstructions occur on an AUB line or on the main side of the AUB clean-out, then AUB will correct the problem. If the obstruction is on the customer side of the AUB clean-out, the customer is responsible for all corrective measures, AUB will not inspect or correct the obstruction on the customer’s service line.

If a clean-out does not exist and a blockage is found on the service line, then AUB will install an AUB clean-out and determine the location of the blockage. If the obstruction is on the customer side of the newly installed AUB clean-out, then AUB field personnel will inform the customer that they need to contact a plumber or contractor to unstop the service line.

History of Grinder Pump Program

“Pressure sewers using grinder pumps were first adopted early in the 1970’s by a few visionary engineers and regulatory agencies who, faced with the virtually insurmountable problems posed by the helter-skelter adoption of septic tanks in the suburbs, felt that the potential gains justified the risk of being a pioneer.

It has taken three decades, corresponding to nearly 60% of this author’s working life, for pressure sewers to begin to take their proper place within the public health engineering field. For indeed today there are hundreds of thousands of grinder pumps in routine daily operation in projects ranging in size from a single pump to many with thousands of pumps. The skeptics have been pleasantly surprised as decades of operating experience pile up with O&M costs equal to or less than original estimates.

Even with general adoption in every state and a new generation of consulting engineers who don’t even remember when there weren’t pressure sewers, there are still a few applications and variations which are not generally considered. These include more general application of trenchless technology, indoor installations, use as a weapon in the fight against infiltration and inflow, application in flat land, and as an excellent stop gap measure to fight waterfront pollution one house at a time by re-siting absorption fields “*up, up and away!*” from the water’s edge.”

“The “Secret” Life of Pressure Sewers“

By: R. Paul Farrell
Consulting Engineer
Niskayuna, NY, USA



Brentwood Water Services

Sewage Grinder Pump Program

**Grinder Pump
Maintenance
Program**

**Frequently
Asked
Questions**

Brentwood Water Services

1750 General George Patton Dr
Brentwood, TN 37027

Phone: 615-371-0080

Fax: 615-371-2225

www.brentwood-tn.org

Purpose

The purpose of this brochure is to define the requirements of the builder, developer, homeowner, and The City, pertaining to the installation and maintenance of individual residential grinder pump sewer systems.

What is a Residential Sewage Grinder Pump System?

Traditionally sewer service to a house is provided by a “gravity” line. This means that the drain lines from the house flow down pipes to the public “gravity” sewer main. When this method of sewer service is unavailable due to any number of reasons, a “low pressure sewer” is often installed to provide sewer service to homes. This method of sewer service requires the use of sewage grinder pumps to pump sewage from the house out to the public sewer. The public sewer line in this case is typically a low pressure force main meaning the sewage in the line does not flow by gravity but is pumped through the line by the individual grinder pumps.

Why does the City operate a grinder pump maintenance program?

The City operates a grinder pump maintenance program because the use of a residential grinder pumps requires additional ongoing maintenance compared to traditional gravity sewer service and also because well maintained grinder pumps help the public sewer system operate better and more efficiently.

Please contact Brentwood Water Services if you have any other questions at 371-0080.

What is the process for installing a grinder pump system?

Once a residential development, which includes a low pressure grinder pump sewer system, has been fully approved by The City, the developer or homeowner is required to pay a \$1900 “Grinder Pump Maintenance / Replacement Fee” for each individual residential lot with such sewer service and sign a grinder pump maintenance program agreement. As part of obtaining a building permit, the current sewer tap fee (\$5000) must also be paid.

The builder / owner is then required to install the grinder pump system according to the current City of Brentwood sewer specifications. The specifications include: pump type, tank type, control panel and electrical disconnect, electrical conduit, p.v.c. piping, tank depth and location.

The grinder pump system is inspected twice during installation by the Sewer Department’s inspector. The first is an underground inspection, the second is a final electrical / practical inspection before a “certificate of occupancy” is issued.

What are the various parts of a grinder pump system?

A residential grinder pump system includes a grinder pump installed within a basin buried in the yard. The sewer drain from the house is plumbed into this basin. The grinder pump pumps out of this basin into typically a 1 ½” service line that runs out to the public sewer main near the road. Just prior to the connection to the public sewer main, a check valve and ball valve assembly is installed typically near the R.O.W. An electrical control panel and disconnect

box are typically installed on the exterior of the house near the grinder pump basin.

Who owns the grinder pump and how is it maintained?

Ownership of the grinder pump system including the pump, tank, electrical controls, and all piping & valves from the house to the public sewer main is by the homeowner. Once installation of the system is approved, the City will provide a maintenance program following the first year of operation. During the first year; the Builder, Plumber, Distributor, or the Manufacturer will be responsible for all repair & maintenance associated with the grinder pump system.

One year after the date on the “certificate of occupancy” or date of approval by City staff, the City of Brentwood’s Water Services Department will provide a program for all repair & maintenance of the grinder pump sewer system. However, the homeowner is responsible for damage incurred from subsequent construction or otherwise altering the system or access to it.

What are the service fees and how do I call for service?

The City charges a service call fee of \$35 regular business hours, and \$60 nights, weekends, and holidays. There is no charge for parts or labor.

For service calls please call the City of Brentwood Water Services Department at 371-0080 during regular business hours and 371-0160 during non-business hours.

<https://fudknox.org/faq/#cat-14>



Where community comes first.



[HOME](#) [ABOUT](#) [CUSTOMER SERVICE](#) [SAFETY & OUTAGES](#) [DEPARTMENTS](#) [COMMUNITY](#) [FAQ](#)

Sewer E-1 Pumps

What is an E-1 Pump? Why would I have one?

First Utility District carefully manages sewer connections for its customers, providing maintenance and repairs and educating customers on ways to keep costs low.

There are two basic types of sewer systems. If the property is high enough above the sewer station, the sewer connection is gravity-fed. If it is too low to provide enough pressure, a grinder pump, called an E-1 Pump, is installed in the connection.

We estimate that about two thousand E-1 Pumps are being used by First Utility District Customers. FUD maintains about 2000 pumps.

Many people may not know they have a pump in their system, because it goes unnoticed if it is working properly. If there is a problem with the pump, an alarm will sound—either a buzzer or a beep, depending on the pump model.

If you notice an unexpected alarm noise on your property, check to see if you have an E-1 Pump. If the alarm goes off, notify FUD at (865) 966-9741. We will tell you how to silence the alarm and send a crew to repair it.

In some cases, the repair requires pump replacement, which we do at no additional charge. We will also repair any damage to your yard. Note: Especially with sewer repairs, we may have to wait for the lawn to dry or settle before we can complete repairs; please be patient.

If you are required to have an E-1 pump, there is a \$9.00 maintenance fee added to your monthly sewer charges.

Residential Grinder Pump System Operating Tips

Your familiarity with the precautions outlined below is important to the reliable operation of your residential grinder pump system.

- Become familiar with the general function, layout, and limitations of the system
- Know the location of the pump basin and control panel outside your home and the location of the grinder pump system circuit breaker within your home
- Do not flush glass, metal, shells, rocks, diapers, rags, cloth, disposable wipes, sanitary napkins, tampons, plastic, gasoline, motor oil, flammable material, or explosives into the system
- Keep the pump basin access cover and control panel easily accessible at all times
- **Don't cover the pump basin access cover, except** as approved by Kitsap County.
- Do not drain hot tubs or add excessive flow to the system
- Do not dig without first identifying the location of buried underground electrical cables and piping
- Limit water use during a power outage – without power the pump basin can only hold 5 to 10 toilet flushes before it overflows
- If you have an emergency generator that you plan to use for the grinder pump system be familiar with your generator and the grinder pump system transfer switch before a power outage occurs
- In case of pump failure or system alarm, minimize water usage and contact the Service Representative
- If your residence is left unoccupied for more than a couple of weeks purge the system by running clean water into the unit until the pump activates, shut off the water and then allow the pump to run until it shuts off automatically

Thank you for your attention to these details. With proper care and attention your residential grinder pump system should provide many years of trouble free service.



Kitsap County Public Works

Sewer Utility Division

Residential Grinder Pump System

Customer Information



Kitsap County Public Works

Sewer Utility Division

614 Division St MS 27

Port Orchard, WA 98366

Dear Customer:

This information is being provided to you because the residence at this address is equipped with a residential grinder pump system. This system takes liquid waste from your home and pumps the waste to the **County's** sewage conveyance system located in the public right of way. The residential grinder pump system at this residence includes a pump, pump basin, piping, and electrical controls.

The system is owned by Kitsap County and as the homeowner or tenant you are responsible for its proper usage. It is essential that certain precautions be observed at all times to insure safe and reliable operation of the system. Improper care or misuse of the system could cause a failure that may result in a sewage back up into the residence as well as costly repairs being billed directly to you. This information is provided 1) to all new residents or tenants, 2) each year as annual customer reeducation, and 3) during each maintenance site visit.

Maintenance of the system is performed XXXXXX. under a service contract to Kitsap County. XXXXX. is responsible for preventive maintenance, planned corrective maintenance, and 24 hr/day emergency maintenance. Under normal circumstances the fees for these services are included in the monthly sewer bill. However, all costs incurred by the County as a result of customer misuse of the system will be billed to the customer. Additional fees may also be billed to the customer if maintenance access to the system is denied or restricted.

The XXXXXX. service representative for your residential grinder pump system is _____. If you have any questions about your system or need to report an emergency he can be reached at _____. Your call will be returned within one hour and if necessary to resolve an emergency, a site visit will be made within four hours. If you need additional assistance you may contact _____. For additional information please review the Frequently Asked Questions.

Why should I be familiar with the grinder pump system?

Some problems can be inadvertently caused by homeowners or tenants because of their lack of understanding of their residential grinder pump system. Circuit breakers can be left off, too much flow can be added to the system, maintenance access can be obstructed, or prohibited substances can be flushed into the system. Simply taking the time to become familiar with the system can help to avoid many costly mistakes. Remember, your grinder pump serves only your residence, what you do directly affects its operation. Any costs incurred as a result of customer misuse, either intentional or unintentional, will be charged to the customer.

What are my responsibilities?

- As the homeowner or tenant you are responsible for the gravity sewer from the building to the residential grinder pump basin inlet and for the power distribution system including the emergency transfer switch (if installed) from the building to the grinder pump alarm panel.
- XXXXXX. is responsible from the pump basin inlet, through the pump, to the point of discharge into the County sewer main, and for the electrical equipment from the pump panel to the pump motor.
- County is responsible from the point of connection to the sewer main at the right of way to the treatment plant.

What services are covered by my monthly grinder pump sewer charges?

Your grinder monthly grinder pump sewer charges cover preventative maintenance, repair of normal wear and tear, and 24/7 emergency stand by response capabilities. Customer misuse of equipment, damage caused by operator error, or providing power during an electrical power outage is not covered by monthly grinder pump sewer charges.

What constitutes misuse of the grinder pump system?

- Flushing prohibited substances into the grinder pump system.
- Constructing unauthorized alterations around the pump basin or alarm panel.

What are prohibited substances?

Prohibited Substances that must not be flushed into the grinder pump system include glass, metal, shells, rocks, diapers, rags, cloth, sanitary napkins, tampons, plastic, gasolines, motor oil, flammable material, or explosives. The grinder pump must grind all solids into small pieces before they can be pumped into the County sewer. These prohibited substances can cause premature wear on the pump, plug the pipe lines, or cause the system to explode. These substances can also cause costly problems to the downstream infrastructure and treatment works. Customers will be charged for any damage caused by flushing prohibited substances into the residential grinder pump system.

Why must the residential grinder pump basin be above ground level?

First, maintenance personnel must have access to the pump basin at all times. Second, the system is designed to handle household waste only, ground water must not be allowed to enter the pump basin.

What if my home is going to be left unoccupied for longer than a couple of weeks?

During long periods of inactivity solids can harden and plug both the grinder pump and grinder pump forcemain. To prevent this from happening the system must be purged with clean water prior to being left inactive. Using the following procedure should help avoid any problems.

- Run clean water into the unit until the pump activates.
- Shut off the water and allow the grinder pump to run until the system shuts off automatically
- Caution: Do not disconnect power to the unit.

What should I do before I dig?

Your residential grinder pump system includes buried piping and electrical systems located on your property. Before digging near any area that may have these buried utility systems refer to the Easement Area Sketch included in your Easement Agreement for general system layout. If you determine that buried utility systems may be in the area where you will be digging you should then call 811 and a qualified technician will be scheduled to make a site visit to assist in locating the underground utilities on your property. For non-emergency work allow 3-5 working days for service.

What should I do in an emergency?

First cut your water use back to a minimum and then call your XXXXXX. Service Representative. He will call back within one hour. Many times he will be able to help you troubleshoot and correct the problem without requiring a site visit. This is where your understanding and familiarity with the system will come in handy. If necessary he will make a site visit to correct an emergency within four hours.

What should I do in an electrical power outage?

Your residential grinder pump system will not work without power. Neither XXXX. nor the County are responsible for providing power to your system during a power outage. Most power interruptions are of a short duration and are of little concern. Simply limiting your water use during this time will avoid any problems. Typically your system will have reserve capacity for 5-10 toilet flushes. For longer duration power interruptions the grinder pump system can be supplied power through a manual electrical transfer switch, if one is installed. This is a procedure that requires close attention to detail that should be practiced before an emergency occurs. Any damage caused to the residential grinder pump system by improper operation will be charged directly to the customer.

Sanitary Sewer Issues Continue In Leesburg

inkfreeneews.com/2018/12/11/sanitary-sewer-issues-continue-in-leesburg

Lasca Randels

December 10, 2018



Pictured, from left, Leesburg Council Vice-President Doug Jones and President Tom Moore.

LEESBURG — Discussion regarding sanitary sewer issues continued at this month's Leesburg Town Council meeting held Monday, Dec. 14. Jason Bradley, representative from Covalen, Indianapolis, attended the meeting to address the frequency of sanitary sewer issues the town has been experiencing.

"We want to see if we can trend this out. Some things that can cause a pump to go out before the time it should be is misuse, which I think you do have some misuse here," said Bradley.

"The other would be if the station is getting more flow than it is designed to do."

"We want happy customers," said Bradley. "That's why we want to figure out what's going on."

Last month Derek Tenney of Tenney & Sons, Warsaw, reported recent issues with pumps at several Leesburg residences. Tenney reported finding wipes, feminine products and other items that should not be flushed.

At Monday night's meeting, Tenney reported that four pumps had gone down over the past month. Two of the pumps were down due to stator issues. Another one was due to the circuit board. The fourth one was at a residence on Prairie Street. According to Tenney, the pit at that residence was full of wipes, feminine products and other non-flushable items.

Council President Tom Moore suggested that Tenney hand out papers with information describing what can and cannot be flushed.

“This is only going to continue. Everyone needs to know that is a violation of a city ordinance,” said Moore. “There is a fine process, and that will start to be enforced if they are going to continue to ignore what they cannot put down the sewer lines.”

Council members agreed that it will be necessary to begin issuing citations for the sewer ordinance violations.

“Let’s issue an ordinance violation and it will stop,” said Street Commissioner Craig Charlton. “It’s happened with the parking issue. It’s happened with the abandoned vehicles. I know you hate to be the bad guy, but you have to be the bad guy.”

“Ultimately what happens is that when your cost of repair continues to go up, the rates have to go up,” Moore stated.

“The violators not only shoot themselves in the foot, they shoot their neighbors in the foot also,” added Council Vice-President Doug Jones.

Other News:

- Council members approved the purchase of two wastewater pumps to replace two that recently failed at the lift station. The pumps will be purchased from Flow-Technics Inc., Illinois, at the price of \$15,725.
- Approval was given for Charlton to purchase a rubber wear bar and replacement lights for the plow.
- The 2018 salary ordinance was amended, and the 2019 salary ordinance was approved.
- Two change orders were approved regarding construction at the town hall building.
- No parking on any street between 3-5 a.m.
- No burning in the town of Leesburg.
- A special meeting will be held at 6 p.m. Monday, Dec. 21, at 100 W. Van Buren St., Leesburg, regarding encumbrance funds for the street paving and sealing project.
- The next regular meeting will be held at 6:30 p.m. Monday, Jan. 14.



Leesburg Clerk-Treasurer Mike Searfoss

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OUCG ATTACHMENT JTP-7
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CAUSE NO. 45151

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OUCG ATTACHMENT JTP-9
CAUSE NO. 45151

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OUCG ATTACHMENT JTP-10
CAUSE NO. 45151

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OUCC ATTACHMENT JTP-11
CAUSE NO. 45151

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OUCC ATTACHMENT JTP-12
CAUSE NO. 45151

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CAUSE NO. 45151

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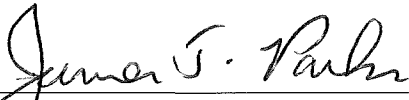
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CAUSE NO. 45151

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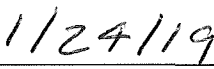
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OUCC ATTACHMENT JTP-14
CAUSE NO. 45151

AFFIRMATION

I affirm the representations I made in the foregoing testimony are true to the best of my knowledge, information, and belief.



By: James T. Parks
Cause No. 45151
Indiana Office of
Utility Consumer Counselor



Date: