

STATE OF INDIANA

INDIANA UTILITY REGULATORY COMMISSION

IN THE MATTER OF THE PETITION OF)	
THE TOWN OF CHANDLER, INDIANA,)	
FOR APPROVAL OF A NEW SCHEDULE)	
OF RATES AND CHARGES FOR WATER)	
UTILITY SERVICE AND FOR)	
AUTHORITY TO ISSUE REVENUE)	CAUSE NO. 45062
BONDS TO PROVIDE FUNDS FOR THE)	
COSTS OF THE ACQUISITION AND)	
INSTALLATION OF IMPROVEMENTS)	
AND EXTENSIONS TO THE)	
WATERWORKS OF THE TOWN)	

PETITIONER’S EXHIBIT NO. 2

Prepared Direct Testimony and Attachments of
J. Christopher Kaufman Jr.
Water Resources Department Manager for
Beam, Longest and Neff, LLC

Sponsoring Petitioner’s Attachment Nos. JCK-1 through JCK-4

VERIFIED DIRECT TESTIMONY OF CHRIS KAUFMAN

1 **Q. Please state your name, employer, and business address.**

2 A. My name is J. Christopher Kaufman Jr. and I am the water resources department
3 manager at Beam, Longest and Neff, LLC ("BLN"), an engineering consulting firm. My
4 business address is 8126 Castleton Road, Indianapolis, Indiana 46250.

5
6 **Q. For whom are you testifying?**

7 A. I am testifying on behalf on the Town of Chandler, Indiana ("Petitioner").
8

9 **Q. Briefly describe your qualifications.**

10 A. I received a bachelor of science in civil engineering from Valparaiso University and a
11 Master of Business Administration from the University of Notre Dame Mendoza College
12 of Business. I began my professional career as an engineer in 1998 as a civil engineer
13 with the Indiana Department of Transportation. Thereafter, I worked as an
14 environmental engineer with Nolte Associates and BLN. For the last four years I have
15 worked as the water resources department manager for BLN. In each of these roles I
16 have gained significant experience in design and project management of water utility
17 projects throughout the State of Indiana.

18

19 **Q. What is the purpose of your testimony?**

20 A. I am testifying in support of Petitioner's request for authority to issue bonds and
21 increase rates in support of its proposed project. My testimony primarily describes

1 Petitioner's new water infrastructure projects that Petitioner proposes to undertake.
2 Petitioner retained BLN to identify necessary improvements and extensions to the
3 waterworks utility owned and operated by Petitioner and to develop preliminary cost
4 estimates with respect to these improvements and extensions. Petitioner subsequently
5 retained BLN to design and provide construction administration services for these
6 projects.

7

8 **Q. Please identify the attachments you will be sponsoring and for which you will be**
9 **providing testimony.**

10 A. Petitioner's Attachment JCK-1 is the Water Improvement Project Preliminary
11 Engineering Report. Petitioner's Attachment JCK-2 offers a map of the Bell Road
12 Relocation Project. Petitioner's Attachment JCK-3 details the location of the mains and
13 various assets relating to the Downtown Replacement Project. Petitioner's Attachment
14 JCK-4 (and Appendix C of the Preliminary Engineering Report) shows the route of the
15 Transmission Line Project and identifies properties affected by it.

16

17 **Q. Were these attachments prepared by you or under your direction and supervision?**

18 A. Yes.

19

20 **Q. Have you testified before the Indiana Utility Regulatory Commission (the**
21 **"Commission") before?**

22 A. No.

23

The Water Improvement Project Background

1
2
3 **Q. Please describe the Petitioner's waterworks and the reasons for the proposed project.**

4 A. The service area of Petitioner's water utility extends well beyond the boundaries of the
5 Town of Chandler and includes much of southwestern Warrick County, Indiana.
6 Petitioner's service area extends west-to-east from the City of Evansville, Indiana, and
7 Interstate 69 east almost to Boonville and north-to-south from about one mile north of
8 the Town of Chandler to areas adjacent to areas served by Indiana-American Water
9 Company and in some places almost to the Ohio River. The area has experienced
10 significant residential and commercial growth in recent years, particularly in the
11 western region. Petitioner's witness Robert D. Coghill explains some of the primary
12 drivers of this growth. The significant growth in the area is likely to continue into the
13 foreseeable future. As outlined in our Preliminary Engineering Report in Attachment
14 JCK-1, rapid growth is occurring in Ohio Township, where most of the proposed project
15 will occur. We are projecting, for the purposes of planning water system improvements,
16 an average growth rate of 1.8% per year through the 20-year planning period. To deal
17 with this growth, Petitioner's waterworks utility must expand the capacities of its
18 various facilities. In addition to its response to growth, significant portions of
19 Petitioner's distribution and transmission facilities are nearing the end of their useful
20 lives, necessitating major rehabilitation or replacement. BLN recommends that Petitioner
21 construct an additional transmission line and replace certain distribution lines.

22
23 **Q. Please describe the proposed project.**

1 A. The project involves the acquisition, construction, installation, and equipping of a road
2 relocation project, line replacement, an additional transmission line, and related
3 waterworks improvements (the "Project"). In particular, the Project will include three
4 subareas: (1) the Bell Road Relocation Project, (2) the Downtown Replacement Project,
5 and (3) the Transmission Line Project.

6
7 **Bell Road Relocation Project**

8
9 **Q. Please describe the Bell Road Relocation Project.**

10 A. The Bell Road Relocation Project involves the relocation of water main prior to a road
11 reconstruction project. Bell Road is located between C.R. 900 W and C.R. 775 W with the
12 project bounded by Telephone Road on the north and High Pointe Drive on the south.
13 Petitioner's Attachment JCK-2 details the location of the main and various assets related
14 to it. The project is spearheaded and driven by Warrick County, Indiana ("Warrick
15 County"), and financed by the Indiana Department of Transportation ("INDOT").
16 Warrick County anticipates the road reconstruction project to commence in early 2019,
17 which makes this project a priority for the water utility.

18
19 The existing water main is located outside of the pavement and within public right-of-
20 way. Most of the original mains were installed in the late 1960s and early 1970s and are
21 made of asbestos cement. Currently, the Bell Road main is composed of ten (10) inch, six
22 (6) inch, and four (4) inch pipes. The ten (10) inch mains will be replaced with newer ten
23 (10) inch mains, while the six (6) and four (4) inch mains will be replaced with newer

1 eight (8) inch mains. The eight (8) inch water main replacement begins near the
2 intersection of Telephone Road and Bell Road and extends south approximately 4,860
3 feet to the six (6) inch stub installed as part of the Oak Grove Road improvements
4 project. The ten (10) inch water main replacement continues south from the intersection
5 of Bell Road and Oak Grove Road south approximately 3,680 feet to the intersection of
6 Bell Road and High Point Drive.

7
8 **Q. What is the expected cost of the Bell Road Relocation Project?**

9 A. The estimated construction cost of this project in 2017 dollars is about \$1.5 million, plus
10 an additional \$450,000 in non-construction costs for a total of \$1.95 million. The non-
11 construction costs depicted in Table 10 are adjusted for inflation at 3% and do not
12 include right-of-way services, land cost, legal, financial, or other professional services.
13 Petitioner is responsible for the cost of the relocation project. Appendix D of the
14 Preliminary Engineering Report includes a detailed cost estimate.

15
16 **Downtown Replacement Project**

17
18 **Q. Where is the Downtown Replacement Project located?**

19 A. Not all of these needed mains are located in downtown Chandler, but because most of
20 them are we have described this particular project as the Downtown Replacement
21 Project. Petitioner's Attachment JCK-3 details the location of the mains and various
22 assets relating to the Downtown Replacement Project. This project area includes
23 Williams and State Streets, Adams Avenue, West Washington Avenue, East Washington

1 Avenue, Russell Road, and Gardner Road. Russell Road and Gardner Road are south of
2 Chandler outside of the Town limits but are still grouped in the subarea. Russell Road is
3 between Fuquay Road and State Street. The portion of Gardner Road included in the
4 study is from Russell Road to State Street.
5

6 **Q. What replacement will be involved with the Downtown Replacement Project?**

7 A. The Downtown Replacement Project involves the replacement of approximately 13,000
8 linear feet ("LF") of 6-inch water main and 10,300 LF of 8-inch water main in the
9 downtown area of Chandler, Indiana. On Adams Avenue, the project will include
10 replacing 3,689 feet of six (6) inch water main. On Williams and State, the project
11 includes replacing 3,103 feet of six (6) inch water main along Williams Street and adding
12 976 feet of eight (8) inch water main along State Street. On West Washington, the project
13 includes replacing the four (4) inch water main with 4,932 feet of eight (8) inch water
14 main. On East Washington, the project includes replacing the four (4) inch water main
15 with 4,319 feet of eight (8) inch water main. On Russell Road, the project includes
16 replacing the six (6) inch water main with 4,750 feet of six (6) inch water main. On
17 Gardner Road, the project includes replacing the six (6) inch water main with 1,341 feet
18 of six (6) inch water main.
19

20 **Q. What right-of-way acquisition will be needed for the Downtown Replacement**
21 **Project?**

1 A. The Downtown Replacement Project will be located within the public right-of-way in
2 most cases. There are instances where the road is not platted as right-of-way, which will
3 need to be funded as part of the Project process.

4

5 **Q. What alternatives did you investigate for the Downtown Replacement Project?**

6 A. The two alternatives for the problems and concerns facing the Downtown Replacement
7 Project area include pipe rehabilitation and pipe replacement. There are several options
8 when it comes to water main rehabilitation; however, there are limiting criteria such as
9 pipe diameter, site conditions, service connections, etc. The water main sizes in the
10 Downtown project area range from 4-inch to 8-inch with connections ranging from 3-
11 inch to 8-inch. The rehabilitation practices that can be used for this size of pipes includes
12 Cured-in-Place Pipe ("CIPP") and Pipe Bursting ("PB"). CIPP is a trenchless method that
13 applies a liner to the existing pipe. The limitations for this method are: excavation is
14 required for access points, bypass pumping is required during the process, minimum
15 pipe size is 6-inches and upsizing a main is not an option. PB is a trenchless pipe
16 replacement method that involves breaking the existing pipe while drawing in a new
17 pipe of the same or larger diameter. The limitations of this method are: excavation is
18 required for service reconnection, excavation is required at fitting locations which would
19 be used as access points and bypass pumping is required throughout the process. Due to
20 the density of service connections and fittings in the Downtown area, neither of the
21 rehabilitation options would be feasible. As a result, replacement of the existing lines is
22 the preferred and best option.

23

1 **Q. How will construction of the Downtown Replacement Project proceed?**

2 A. This portion of the Project is divided by street. Each street water replacement is
3 essentially an independent project. The intent is that all Downtown replacements will be
4 bid and performed under one contract. The phasing by street will help provide
5 organization during construction and prevent all streets from being affected at one time.

6
7 **Q. What is the expected cost of the Downtown Replacement Project?**

8 A. The estimated construction cost of this project in 2017 dollars is about \$5.66 million, plus
9 an additional \$1.698 million in non-construction costs for a total of \$7.358 million.
10 Appendix D of the Preliminary Engineering Report includes a detailed cost estimate.

11
12 **Transmission Line Project**

13
14 **Q. Please describe the Transmission Line Project.**

15 A. To provide additional capacity and redundancy, the Transmission Line Project involves
16 the addition of a new transmission line from the Water Treatment Facility to the
17 Paradise Water Tower located at intersection of Fuquay Road and Highway 261. The
18 transmission line includes about 42,200 LF of 24-inch pipe and about 7,000 LF of 12-inch
19 pipe. The Transmission Line Project includes a twenty-four (24) inch line from the water
20 plant to the intersection of Jenner Road and Fuquay Road and twelve (12) inch line from
21 Jenner and Fuquay south to Paradise Tower. The transmission line route begins at the
22 water plant and the twenty-four (24) inch line extends north to the Grimm Road water
23 tower. From the tower, the twenty-four (24) inch line continues north. At Oak Grove

1 Road, a stub west connects to the fourteen (14) inch line on Epworth Road while the
2 Transmission Main continues north to Telephone Road. At Telephone Road the main
3 continues east 10,560 feet then jogs north to Jenner Road where it continues east to
4 Fuquay Road. At the intersection of Jenner and Fuquay, 6,970 feet of twelve (12) inch
5 main continues south to the Paradise Tower.
6

7 **Q. What right-of-way acquisitions will be necessary for the Transmission Line Project?**

8 A. The majority of the Transmission Line Project is not located within existing public right-
9 of-way and will require property acquisition. By placing the transmission line outside of
10 public right-of-way and within an easement, it will prevent future projects within the
11 right-of-way impacting the line. Petitioner's Attachment JCK-4 (and Appendix C of the
12 Preliminary Engineering Report) shows the route of the project and identifies properties
13 affected by the project.
14

15 **Q. What alternatives did you consider with the Transmission Line Project?**

16 A. A previous study was conducted to provide the Town of Chandler with alternatives as
17 to the layout and size of the Transmission Line. This study can be found in Appendix E
18 of the Preliminary Engineering Report. The study modeled three size alternatives (16-
19 inch, 20-inch, and 24-inch) and several route options. The study concluded that the 20-
20 inch and 24-inch would provide sufficient fire flows. The route options identified were
21 compared on a preliminary cost basis and the study directed further investigation to
22 determine the appropriate route.
23

1 **Q. What is the expected cost of the Transmission Line Project?**

2 A. The Transmission Line Project is estimated to cost, in 2017 dollars, about \$13.02 million,
3 plus an additional \$3.906 million in non-construction costs for a total of \$16.926 million.
4 Appendix D of the Preliminary Engineering Report includes a detailed cost estimate.

5

6 **Q. Does this conclude your direct testimony in this cause?**

7 A. Yes, at this time.

VERIFICATION

I, J. Christopher Kaufman Jr., affirm under penalties of perjury that the foregoing representations are true and correct to the best of my knowledge, information, and belief.



J. Christopher Kaufman Jr.

Date: 3/13/2018

Attachment No. JCK-1
Petitioner's Exhibit No. 2 (J. Christopher Kaufman Jr.)
Town of Chandler, Indiana

**CHANDLER WATER UTILITY
WATER IMPROVEMENTS PROJECT
PRELIMINARY ENGINEERING REPORT**

Town of Chandler, Indiana

February 14, 2018

PREPARED BY

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**BLN JOB NO.
170036 and 170045**

Chandler Water Improvements Project Preliminary Engineering Report

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Chandler Water Improvements Project Preliminary Engineering Report

1. PREFACE

1.1. Project Scope and Project Study Areas

The project areas of study for Chandler Water improvements are divided into the following 3 subareas: Downtown, Bell Road, and Transmission Line. The Chandler Utility service area extends beyond the Town limits and is in southwest Warrick County. The service area is further defined in Section 2.1. The Downtown subarea includes Williams and State Streets, Adams Avenue, West Washington Avenue, East Washington Avenue, Russell Road, and Gardner Road. Russell Road and Gardner Road are south of Chandler outside of the Town limits but are still considered part of the Downtown subarea due to the similar nature of the projects. Russell Road is between Fuquay Road and State Street. The portion of Gardner Road included in the study is from Russell Road to State Street. The Bell Road subarea is southwest of the downtown area. Bell Road is located between C.R. 900 W and C.R. 775 W with the project bounded by Telephone Road on the north and High Pointe Drive on the south. The Transmission Line subarea is approximately 9 miles in length. The subarea begins at the Water Treatment Facility and ends at the Paradise water tower located at the intersection of Fuquay Road and Highway 261. Exhibit 1 in Appendix B includes the existing water distribution system and the proposed improvements for all subareas.

The project scope includes the replacement of approximately 13,000 linear feet (LF) of 6-inch water main and 10,300 LF of 8-inch water main in the downtown area of Chandler, Indiana. There will also be a water main relocation along Bell Road which includes 4,900 LF of 8-inch and 3,700 LF of 10-inch water main from Telephone Road to High Pointe Drive. To provide additional capacity and redundancy, a transmission line is proposed from the Water Treatment Facility to the Paradise water tower located at intersection of Fuquay Road and Highway 261. The transmission line includes 42,200 LF of 24-inch pipe and 7,000 LF of 12-inch pipe.

1.2. Need for Project

A. Transmission Line

In 2013, a study was conducted to analyze distribution improvements for deficiencies identified in the 2012 model update. The study indicates the Paradise elevated storage tank is unable to provide a reliable water supply

Chandler Preliminary Engineering Report Section 1 – Preface

during peak demand periods. The distribution system was also analyzed to evaluate future needs based on projected growth. A copy of the 2013 report is included in **Appendix E** for reference.

There is a Medical TIF district in the southwest portion of Chandler Utilities service area. This area has grown over the last several years and continued growth is projected. The medical facilities near Warrick Trail are currently served by a 12-inch water main, which lacks redundancy. With the current system, a break in the distribution main would significantly impact supply to the medical facilities and could even result in temporary loss of water service. The proposed 24-inch transmission line will provide redundancy to the existing system and add capacity for the future growth of the medical facilities and surrounding areas. The transmission line will also provide redundancy to the 14-inch line on Epworth Road and the Grimm Road water tower.

There is a high-pressure zone, a medium-pressure zone, and a low-pressure zone within the Chandler water distribution system. The transmission line will provide additional capacity to the low-pressure zone by connecting to the Paradise elevated storage tank, which is located at Fuquay and S.R. 261. Chandler Water Treatment Facility (WTF) operates at approximately 50% capacity. Expansion of the existing facility will not be required for this project because the Transmission Line will transport up to the maximum plant output of 4.32 MGD. The existing water system is further discussed in Section 3.1.

B. Downtown Water Replacement Projects

Several water mains within the downtown area are aged, cast iron pipes, and Chandler Utilities is routinely dealing with breaks in these mains. The water main breaks disrupt service to the residents, disrupt traffic in the residential areas, and expend Chandler Utility Department resources. The breaks will increase as the pipes continue to age.

C. Bell Road Water Relocation

An INDOT project to widen Bell Road is driving the relocation of the Bell Road water main. The existing water main is located outside of the pavement and within public right-of-way. Chandler Utilities is financially responsible for the relocation, and the project is scheduled to move forward in 2019.

Chandler Preliminary Engineering Report Section 1 – Preface

1.3. Summary of Recommendations

An engineering analysis of the Chandler water system has been conducted to identify the most beneficial water improvement projects. In the Downtown subarea, six streets have been identified to have failing water mains. The recommendation is to replace the mains and upsize if necessary. Bell Road water main relocation is driven by the road widening project and is anticipated to take place in 2019. To address the lack of redundancy, increase capacity, and provide additional flow from the high-pressure zone to the low-pressure zone, a Transmission Line from the Water Treatment Facility to the Paradise water tower is recommended.

Chandler Preliminary Engineering Report
Section 2 – Project Location

2. PROJECT LOCATION

2.1. Location

The Town of Chandler is located east of Evansville on SR 62 in Warrick County. The Chandler Water Improvements Project (Project) is located in three separate subareas in the utility service area.

2.2. Service Area

The twenty-year planning area for the Chandler Water Utility (Planning Area) encompasses an area much larger than the corporate limits of the Town of Chandler. The water utility’s Planning Area stretches from the Ohio River north to around Kansas Road, located about two miles north of Chandler. The Planning Area also extends west past Epworth Road and east past Eskew Road. Other water utilities serve some customers within the general Planning Area limits, mostly in the southern half of the area. Overall, the Planning Area encompasses about 45 square miles of land. Topographical elevations within the Planning Area range from 370 feet to 510 feet above msl (mean sea level). The Planning Area is served by Interstate 69 and State Roads 62, 66, 261, and 662. In the following **Table 1**, we have outlined the proportion of each township that is served by the Chandler Water Utility.

Table 1: Proportion of Planning Area in Various Townships

Township	Township Area (mi²)	Planning Area in Township (mi²)	Percent of Township	Percent of Planning Area
Boon	84.5	11.2	13.3%	25.04%
Campbell	39.0	6.8	17.5%	15.24%
Ohio (less Newburgh)	37.4	26.8	71.6%	59.72%

The Planning Area is shown in **Appendix A-Planning Area Map**.

Land use within the Town of Chandler is primarily residential with a central commercial district composed of various small businesses. The Planning Area outside the Town of Chandler includes farmland, residential developments, mining reclamation areas, and some commercial establishments. Rapid growth of residential and small commercial customers is occurring in the south and southwest quadrants of the Planning Area. A major hospital complex has been developed, with continuing major construction projects, near I-69 and SR 66 in the far west-central portion of the Planning Area. Other growth is expected in this area

Chandler Preliminary Engineering Report Section 2 – Project Location

and Warrick County has created two TIF districts within Chandler Utility service area to assist with some of this growth.

A. Twenty Year Study Area and Twenty Year Service Area

The twenty-year Study Area and the twenty-year Service Area are the same. Exhibit 1 in Appendix A shows the twenty-year Study Area/Service Area.

B. Project Area(s)

The maps included in **Appendix B** show the water main routing for each subarea. The legal locations of the Water Improvement Projects are described in the following **Table 2**. Details of these project areas are included in **Section 6**.

Table 2: Project Location

Project Component	U.S.G.S. Quadrangle Map	Township	Range	Civil Township Name	Sections
New Grimm Rd. Water Tank	Newburgh and Daylight	6S	9W	Ohio	10, 11, 14, 15, 16, 17, 20, 28, 29, 33
		7S	9W		4
Downtown Water Replacements	Boonville and Daylight	5S	8W	Ohio	31
		6S	9W		35, 36 1, 12
Bell Road Water Relocation	Newburgh	6S	9W	Ohio	15, 22

2.3. Right-of-Way Acquisition

The majority of the Transmission Line project is not located within existing public right-of-way and will require property acquisition. The intent is for the transmission line to be outside of public right-of-way and within a water utility easement to prevent future roadway projects from impacting the line. **Appendix C** shows the route of the project and identifies properties affected by the project. The Downtown water replacement projects will be located within the public right-of-way in most cases. There are instances where the road is not platted as right-of-

Chandler Preliminary Engineering Report Section 2 – Project Location

way, which will need to be done in the process of the water replacements. The Bell Road water relocation project is intended to be located within the right-of-way, which will be acquired as part of the INDOT road widening project.

Chandler Water Improvements Project Preliminary Engineering Report

3. CURRENT NEEDS

3.1. Existing System Needs

The existing Water Treatment Plant, located on Pollack Avenue, was built in 2012 with a design treatment capacity of 4.32 MGD (3,600 gpm). Water is supplied through six (6) operating wells. Each well has a capacity of 1,000 gpm providing a firm capacity of 5,000 gpm. The plant operates at approximately 50 percent capacity and provides treatment for removal of iron and manganese. The plant upgrade was designed to accommodate growth and development in the Chandler utility service area. Additionally, the water system includes four elevated storage tanks and 1 standpipe storage tank. The storage tanks are referred to as the Grimm Rd. Tank (Overflow Elevation = 592.00), the Old Plank Rd. Tank (Overflow Elevation = 592.00), the Chandler Tank (Overflow Elevation = 579.50), the Paradise Rd. Tank (Overflow Elevation = 579.50), and the standpipe is Frame Hill Tank (Overflow Elevation = 593.00).

A. Distribution System Needs

In the Chandler distribution system, there are many aged, cast iron pipes which experience breaks routinely. The pipes requiring the most immediate attention are identified as the Downtown subarea for the water improvements project. From the 2015, 2016, and 2017 water line repair data, between 40-50% of the yearly repairs are within the subarea limits. There were 34 total repairs in 2015, 35 in 2016, and the repairs increased to 44 in 2017. The water mains needing immediate attention require replacement and upsizing, in some cases, to meet water demands.

Outside of Chandler Town limits, the distribution system is newer and in better condition. The main need in this area has been relocation, as opposed to replacement, due to roadway projects. Lincoln Avenue is one example of recent roadway projects requiring water relocation. The next relocation project is referred to as the Bell Road subarea for the water improvements projects. There are 33 residential customers directly serviced by the portion of Bell Road water main scheduled for relocation. In addition to the individual service lines, the Bell Road water main connects to 17 other mains providing service and looping to residential neighborhoods within the limits of this project.

Chandler Preliminary Engineering Report Section 3 – Current Needs

B. Supply Needs

As previously mentioned, the water treatment plant currently operates at approximately 50% capacity. The limiting factor for the water system is the transmission of water through the system and to the system's elevated storage tanks. There are also areas of the distribution system which lack redundancy, particularly in the medical development area. Additionally, supply is needed across the system for fire protection. An analysis of water improvements to address these concerns was previously conducted and the report can be found in **Appendix E**.

3.2. Current Population and Consumption

According to the U.S. Census Bureau, the estimated population of the Town of Chandler in 2016 was 3,396 persons. Chandler Water Utility's current service area, which extends well beyond the town limits, includes all or parts of Boon, Campbell, and Ohio Townships. Census data for Warrick County and individual townships have been considered. The average household size for Warrick County is 2.62 people. The water utility serves primarily residential and small commercial customers with a few large commercial customers.

A. Current Customer Base

Based on August 2017 data, there are 6,659 residential customers, 352 small commercial customers, and 7 large commercial customers resulting in a total customer base of 7,018. Based on the average household size, approximately 17,500 residents are currently served by Chandler Water.

B. Current Water Demands

The average and peak day consumption based on record data from 2014, 2015, and 2016 is represented in **Table 3** below. The average day consumption was computed based on the average daily water production over the three-year period. The peak day occurred in August 2016. These are the demands that would currently be placed on the Water Utility. The estimated peak hour demand is also included in this table and was computed using a peaking factor of 1.85.

Chandler Preliminary Engineering Report Section 3 – Current Needs

Table 3: Summary of Water Consumption

Demand Type	Demand
Average Day Demand	1,742,000 (gpd)
Peak Day Demand	2,793,000 (gpd)
Peak Hour Demand	2,418 (gpm)

**Chandler Water Improvements Project
Preliminary Engineering Report**

4. FUTURE NEEDS

4.1. Population Projection

A. Projected Population and Customer Base

Population projections for the Chandler Water Utility are based on the average historical population growth rate of the Planning Area. The population growth rate in the Town of Chandler has remained relatively stable for the last twenty years, because most useable land has already been developed within the town's corporate limits. Growth is occurring in Ohio Township, where most of the Planning Area is located, as shown in **Table 4**.

Table 4: Historical Population of Region

	YEAR			
	1980	1990	2000	2010
Warrick County⁽¹⁾	41,474	44,920	52,383	59,689
Boon Township⁽¹⁾	11,420	11,708	12,844	12,755
Campbell Township⁽¹⁾	1,001	620	480	906
Ohio Township⁽¹⁾	21,318	24,933	31,002	37,749
Town of Newburgh ⁽¹⁾	2,906	2,880	3,088	3,325
Town of Chandler ⁽¹⁾	3,043	3,099	3,094	2,887
Remainder	15,369	18,954	24,820	31,537

⁽¹⁾ From www.stats.indiana.edu

Since no individual or group of census counts covers the area directly, the historical population of the Planning Area was interpolated from the historical population of the various entities in the proportion of the township that is included in the Planning Area. These proportions are outlined in **Table 1**. The estimated historical population of the Planning Area based on these proportions is shown in **Table 5**, below.

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Table 5: Historical Population of the Planning Area

	Year				
	1980	1990	2000	2010	2016
Boon Township	2,859	2,931	3,216	3,194	3,268
Campbell Township	153	94	73	138	147
Ohio Township	12,220	14,420	17,920	22,374	23,697
Planning Area	15,232	17,445	21,209	25,706	27,112
Average Annual Growth Rate		1.5%	2.2%	2.1%	0.9%

⁽¹⁾ Estimated based on average growth rate from 1980 to 2010

The average growth rate of the population in the Planning Area is 2.3% from 1980 to 2010. The growth rate from 2010 to 2016 decreases to 0.9%. For the purposes of planning water system improvements, an average growth rate of 1.8% per year through the 20-year planning period is used.

As previously discussed in Section 3.2, the population in the Planning Area currently served by the Chandler is about 17,500. In our projections, it is assumed that substantially all new residents in the Planning Area will connect to the municipal water system. Projecting the annual growth rate through the Planning Period, with all future growth connecting to Chandler’s water system, the Chandler Water Utility will serve about 28,050 persons by the end of the 20-year planning period. **Table 6**, which follows, outlines these projections.

Table 6: Projected Planning Area Population

	Year				
	2016	2020	2025	2030	2035
Boon Township	3,268	3,503	3,819	4,162	4,537
Campbell Township	147	158	172	187	204
Ohio Township	23,697	25,403	27,689	30,182	32,898
Planning Area	27,112	29,064	31,680	34,531	37,639
Customers (Population)	17,500	19,452	22,068	24,919	28,027

4.2. Projected 20-year Water Demands

A. Projected Water Demands

The growth of the Water Utility’s customer base during the Planning Period was previously discussed. This information provides the basis for the

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projected 20-year water demands. The average consumption per capita per day can be computed based on the average demand divided by the number of customers. From current data, average consumption per capita per day is 99.5. This value is used to compute future water demands.

Based on these values, **Table 7** present the projected average, peak daily, and peak hour water demands of the system through the Planning Period. One note of warning, these values are based on the estimates of current demands described earlier, and upon projections of population growth and type of customer base. The Demands that may occur during an extreme meteorological event (particularly an extreme drought) may vary substantially from these projections.

Table 7: Projected Water Demands

Year	Projected Customers	Average Day Demand (Gallons/Day)	Peak Day Demand (Gallons/Day)	Peak Hour Demand (gpm)
2016	17,500	1,742,000	2,793,000	3,588
2020	19,452	1,936,308	3,104,539	3,988
2025	22,068	2,196,712	3,522,053	4,525
2030	24,919	2,480,508	3,977,072	5,109
2035	28,027	2,789,888	4,473,109	5,747

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5. EVALUATION OF ALTERNATIVES

The previous section highlighted the Water Utility's needs, both current and through the Planning Period. This section reviews the alternatives in each subarea and highlights the reasonable alternatives the Water Utility has considered, to address these needs.

5.1. No Action Alternative

A. Downtown Water Replacement

No action would result in the continuation of repairing water main breaks as needed. Due to the age and condition of the pipes, this is not considered a viable option and has not been investigated further.

B. Bell Road Water Relocation

The Bell Road water relocation project is governed by the INDOT project to widen Bell Road. The water main is currently within the INDOT right-of-way outside of the edge of pavement. INDOT has requested the main be relocated since the existing main location conflicts with the proposed road improvements. No action is not considered a viable option and has not been investigated further.

C. Transmission Line

The no action alternative for the Transmission Line would restrict future economic growth in the service area, several water mains would continue to operate without redundancy, and capacity at the Grimm Water Tower would be unchanged. Based on the opportunity for growth and need for redundancy, no action is not considered a viable option and has not been investigated further.

5.2. Downtown Alternatives Investigated

Pipe rehabilitation and pipe replacement are the two alternatives investigated for the Downtown subarea.

A. Pipe Rehabilitation

There are several options when it comes to water main rehabilitation; however, each rehabilitation option has limiting criteria such as pipe diameter, site conditions, service connections, etc. The water main sizes in the Downtown

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project area range from 4-inch to 8-inch with connections ranging from 3-inch to 8-inch. The rehabilitation practices that can be used for this size of pipes includes Cured-in-Place Pipe (CIPP) and Pipe Bursting (PB). CIPP is a trenchless method that applies a liner to the existing pipe. The limitations for this method are: excavation is required for access points, bypass pumping is required during the process, minimum pipe size is 6-inches and upsizing mains is not an option. PB is a trenchless pipe replacement method that involves breaking the existing pipe while drawing in a new pipe of the same or larger diameter. The limitations of this method are: excavation is required for service reconnection, excavation is required at fitting locations which would be used as access points and bypass pumping is required throughout the process. Due to the density of service connections and fittings in the Downtown area, neither of the rehabilitation options would be feasible.

B. Pipe Replacement

The replacement alternative includes the following streets: Williams and State Streets, Adams Avenue, West Washington Avenue, East Washington Avenue, Russell Road, and Gardner Road. **Table 8** below summarizes the pipe replacement on each street.

Table 8: Downtown Water Replacements

Street Name	Existing Main Size (inches)	Proposed Main Size (inches)	Length Replaced (LF)
Adams Avenue	6	6	3,700
Williams Street & State Street	6	6 8	3,100 1,000
West Washington Ave.	4	8	5,000
East Washington Ave.	6	8	4,400
Russell Road	6	6	4,800
Gardner Road	6	6	1,400

5.3. Bell Road Alternatives Investigated

Relocation was considered for the Bell Road subarea.

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A. Bell Road Relocation

The proposed layout of the water main will be within INDOT right-of-way outside of the edge of pavement. In addition to widening the road, the INDOT project includes curb, gutter, and sidewalk. The water main will be located on the west side of the road to avoid conflicts. It would not be feasible to procure a water easement outside of the right-of-way. Since INDOT has requested the relocation of the water main, this is considered the only feasible alternative.

5.4. Transmission Line Alternatives Investigated

A. Layout and Size Alternatives Considered

A previous study was conducted to provide the Town of Chandler with alternatives as to the layout and size of the Transmission Line. A model was created to compare the alternatives. There were three size alternatives (16-inch, 20-inch, and 24-inch) and several route options. The study concluded that the 20-inch and 24-inch would provide sufficient fire flows. The route options identified were compared on a preliminary cost basis and the study directed further investigation to determine the appropriate route.

5.5. Alternatives Selected

A. Downtown

Water line replacement is recommended on Adams Avenue, Williams & State Streets, West Washington Avenue, East Washington Avenue, Russell Road and Gardner Road. These water mains are prone to breakage. In areas that are currently underserved, the water mains will be upsized with the replacement.

B. Bell Road

Relocation of the water main to be outside the proposed pavement and within INDOT right-of-way.

C. Transmission Line

The Transmission Line will provide redundancy, opportunity for economic growth, and additional flow to the low-pressure zone within the distribution system. The proposed route has been refined from the previous study to optimize connection points for redundancy, reduce construction costs, and

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provide additional capacity for future growth. With the input from Chandler Water Utilities, it is determined the optimum sizing for the line is a 24-inch line from the Water Treatment Facility to the connection at Jenner Road. A 12-inch line will run from Jenner Road to the Paradise Tower.

Chandler Water Improvements Project Preliminary Engineering Report

6. PROPOSED PROJECT

6.1. Project Description

The three subareas considered for the Chandler Water Improvements Project include: Downtown Water Replacements, Bell Road Water Relocation and the Transmission Line. **Appendix B** includes locations and maps of the proposed projects in each subarea.

6.2. Project Phasing

Project phasing was considered in each subarea. It is important to note that phases are independent of each other and do not necessarily need to be performed in subsequent order. Also, work can be done simultaneously within the subareas.

A. Downtown Subarea

In the Downtown subarea, projects are broken up per street. Each street water replacement is essentially an independent project. The intent is that all Downtown replacements will be bid and performed under one contract. The phasing described is to provide organization during construction and prevent all streets from being affected at one time. The appropriate grouping and performance order will be determined in the design phase.

B. Bell Road Subarea

Due to the scope of the project and the project being in conjunction with a road project, phasing is not considered for Bell Road.

C. Transmission Line

The Transmission Line project is considered a single project and does not include phasing.

6.3. Project Schedule

The target construction dates for the Water Improvement Projects are represented in **Table 9** below.

**Chandler Preliminary Engineering Report
Section 6 – Proposed Project**

Table 9: Water Improvement Projects Target Milestones

Project Subarea	Construction Year	Estimated Duration (Months)
Downtown Water Replacements	2019	12
Bell Road Water Relocation	2019	12
Transmission Line	2020	24

6.4. Total Project Cost Estimate (Engineer’s Opinion of Probable Cost)

The Engineer’s Opinion of Probably Cost for each subarea can be found in **Appendix D**, which includes a detailed cost estimate for construction costs, non-construction costs and the Project Financing Information form(s). A summary of the overall project costs is included in **Table 10**.

Table 10: Water Improvement Projects Preliminary Cost Summary

Project Subarea	Construction Cost	Adjustment for Inflation	Estimated Non Construction Cost (Engineering)	Total
Downtown Water Replacements	\$5,660,000.00	\$5,830,000.00	\$1,749,000.00	\$7,579,000.00
Bell Road Water Relocation	\$1,500,000.00	\$1,545,000.00	\$463,500.00	\$2,008,500.00
Transmission Line	\$13,020,000.00	\$13,813,000.00	\$4,143,900.00	\$17,956,900.00

The non-construction costs depicted in **Table 10** do not include right-of-way services, land cost, legal, financial, or other professional services. The non-construction costs include design, engineering fees, construction observation, construction administration, and permitting. It is the assumption that Bell Road will not require survey or right-of-way engineering since it is in conjunction with an INDOT project. A breakdown of the combined total project cost is represented in **Table 11**.

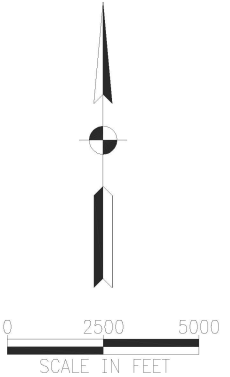
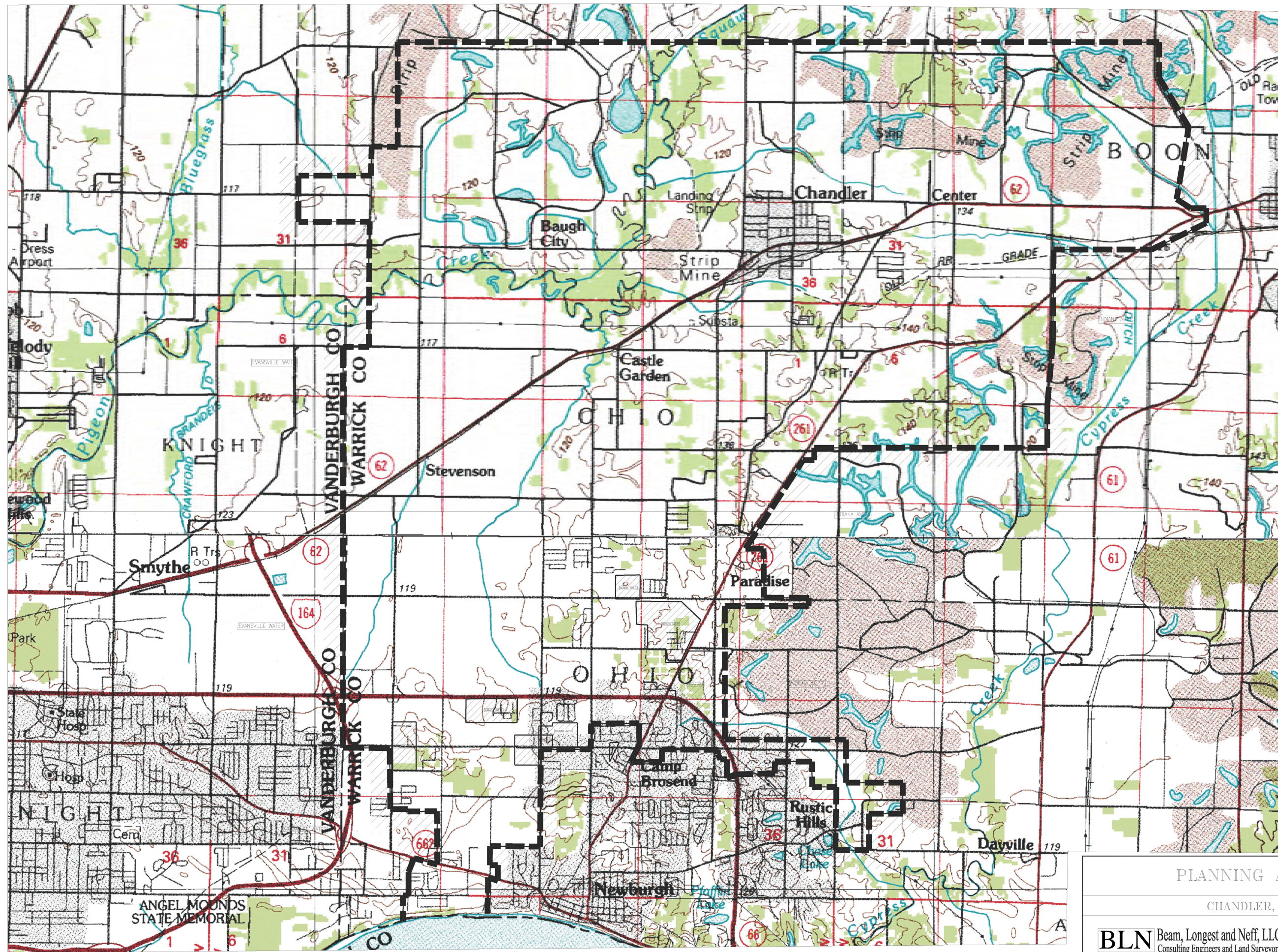
**Chandler Preliminary Engineering Report
Section 6 – Proposed Project**

Table 11: Water Improvement Projects Total Project Costs (dollars)

Non- Construction Component	Cost
Land & Rights-of-way Acquisition	\$1,500,000.00
Design, Engineering Fees, Observation, Administration, and Permitting	\$6,357,000.00
Financing Fees	\$226,000.00
Other	\$23,000.00
Non Construction Sub-total	\$8,106,000.00
Construction Costs Sub-total	\$21,188,000.00
Total Project Cost	\$29,294,000.00

A rate analysis by the Town’s rate consultant has been conducted to determine the rate effect on the Town’s customers as well as the final rate structure.

Appendix A – Study Area and Planning Area Map



LEGEND

	20 YR. SERVICE AREA & PLANNING YR.
	UNINCLUDED AREA

PLANNING AREA MAP
CHANDLER, INDIANA

BLN Beam, Longest and Neff, LLC Consulting Engineers and Land Surveyors	8126 Castleton Road Indianapolis, Indiana 46250 (317)849-5832 (317)841-4280 fax www.b-l-n.com	APPENDIX: A SCALE: 1" = 5000' DATE: MAY 2006
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