

Wallaceburg & Area Water Supply System Municipal Class EA

Public Information Centre 2
November 26, 2014

Chatham – Kent
Public Utilities Commission



Wallaceburg Water Supply System

- Existing system – services Wallaceburg, surrounding area, portions of Chatham Township
- Source Water – Chenal Ecarte (St. Clair River)
- Low lift pumping station, high lift pumping station, two ground level reservoirs (1.14ML, 4.54 ML), elevated water tower (4,546m³)
- Emergency Interconnection – North Kent water system and Lambton Area Water Supply System (LAWSS)
- Rated capacity – 13,600m³/day
- Challenges – Increasing maintenance costs, aging infrastructure, raw water quality concerns and issues

Problem/Opportunity Statement

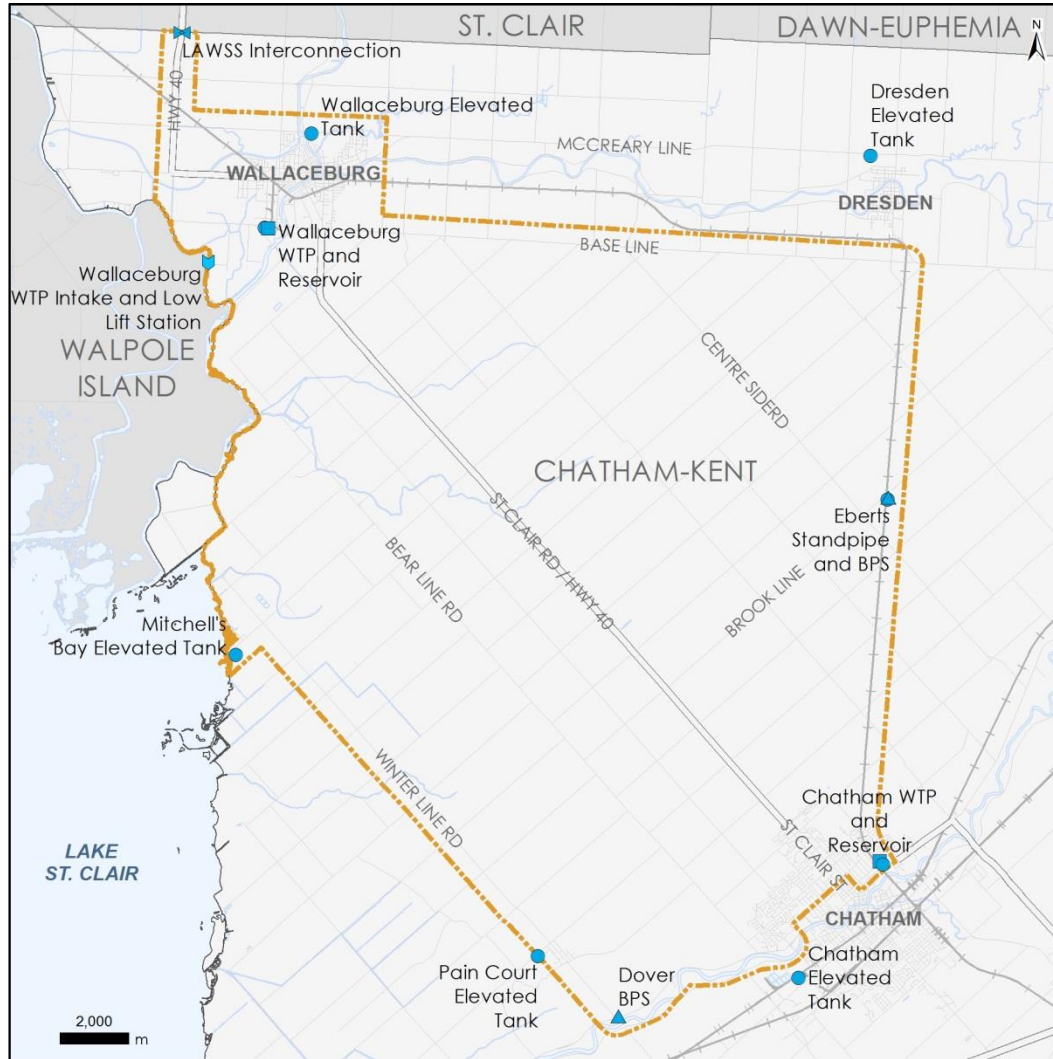
The purpose of the Wallaceburg & Area Water Supply Review Municipal Class Environmental Assessment (Wallaceburg Class EA) is to provide an environmentally sensitive and sustainable framework to assess the various water supply alternatives within the study area.

The Wallaceburg Class EA includes an evaluation of the existing Wallaceburg WTP and raw water source, as well as alternative water supply options including interconnections with other existing systems.

Municipal Class EA Process

- **This project will be undertaken in accordance with the Municipal Class Environmental Assessment**
(MEA October 2000 as amended in 2007 & 2011)
- **Address the requirements of a Schedule C Municipal Class EA**
 - Phases 1 through 4 of the Municipal Class EA
- **Hold three Public Information Centres**
 - PIC 1 – Previously held to introduce the project
 - PIC 2 – Tonight
 - PIC 3 – To be determined
- **Aboriginal, agency and public input is invited for incorporation into the planning and design**
 - Letters and published notices
 - Posted on Chatham-Kent PUC website (www.chatham-kent.ca)
- **Intent is to build on the previous Water and Wastewater Master Plan (2012)**

Study Area



Alternative Solutions

1 Do Nothing

- Not possible, does not address lifecycle issues with the existing system
- Doesn't satisfy the Problem/Opportunity Statement

2 Rehabilitate the Existing Water Treatment Plant

- a) Using existing intake location
- b) Using new intake location

3 Connect to the Chatham Drinking Water System

- a) Via Eberts Booster Pumping Station along Base Line
- b) Via Eberts Booster Pumping Station, along Centre Side Road and Base Line
- c) Along Highway 40
- d) Via Highway 40 with interconnection from Mitchell's Bay
- e) Via Eberts Booster Pumping Station with interconnection from Mitchell's Bay

4 Connect to the Lambton Area Water Supply System (LAWSS)

Technical Review

A series of technical reviews were completed in order to evaluate the identified alternatives

1. Technical Memorandum #1 – Wallaceburg & Area Preliminary Hydraulic Modeling
 - Computer hydraulic modeling to assist with feasibility of each potential servicing alternative
2. Technical Memorandum #2 – Wallaceburg WTP Condition Assessment
 - Asset inventory and replacement / life cycle cost analysis for the Wallaceburg WTP assets
3. Technical Memorandum #3 - Natural Environment Report
 - Characterizes the significance and sensitivity of the natural features in the study area, identify environmental impacts, and recommend mitigation measures

Alternative Solution 1

Do Nothing

- Option does not satisfy the Problem/Opportunity statement
- Does not consider the recommendations of the 2012 Water and Wastewater Master Plan
- Does not address the aging water supply system infrastructure and the identified high priority concerns that are in poor or critical condition
- Does not address the raw water quality concerns associated with flow reversal, agricultural runoff, and spills



Alternative Solution 2

Rehabilitate the existing water treatment plant & associated facilities

- Wallaceburg WTP provides sole supply source for community (with North Kent connection and LAWSS connection as emergency supply)
- Highest long term costs
- Highest operational complexity
- High complexity to rehabilitate the facility or to retrofit
- Construction service disruptions anticipated
- Current annual operating & maintenance cost of approximately \$1M (~\$220K Maintenance, ~\$780K Operating)
- Intake pipe & raw water transmission main identified as a high priority concern requiring immediate replacement
- Further assessed using the existing intake or new intake location
 - **2a – Rehabilitate the existing WTP using existing intake location**
 - **2b – Rehabilitate the existing WTP using new intake location**



Alternative Solution 2a

Rehabilitate the existing water treatment plant & associated facilities using existing intake location

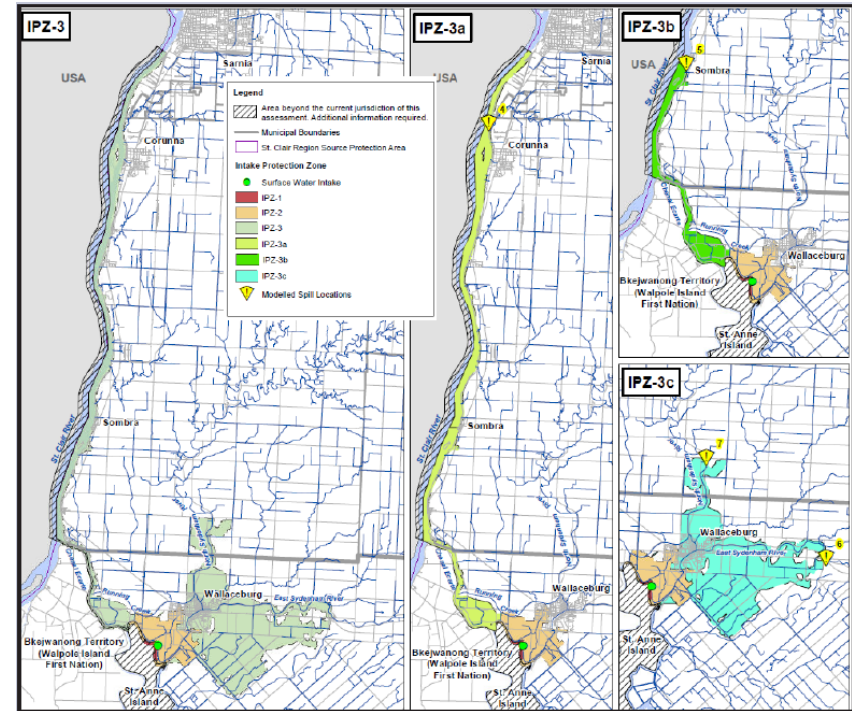
- Existing intake and raw water transmission main would be replaced in the same location
- Does not address raw water quality concerns associated with flow reversal, agricultural runoff, and spills
- Does not require additional Class EA



Alternative Solution 2b

Rehabilitate the existing water treatment plant & associated facilities with new intake location

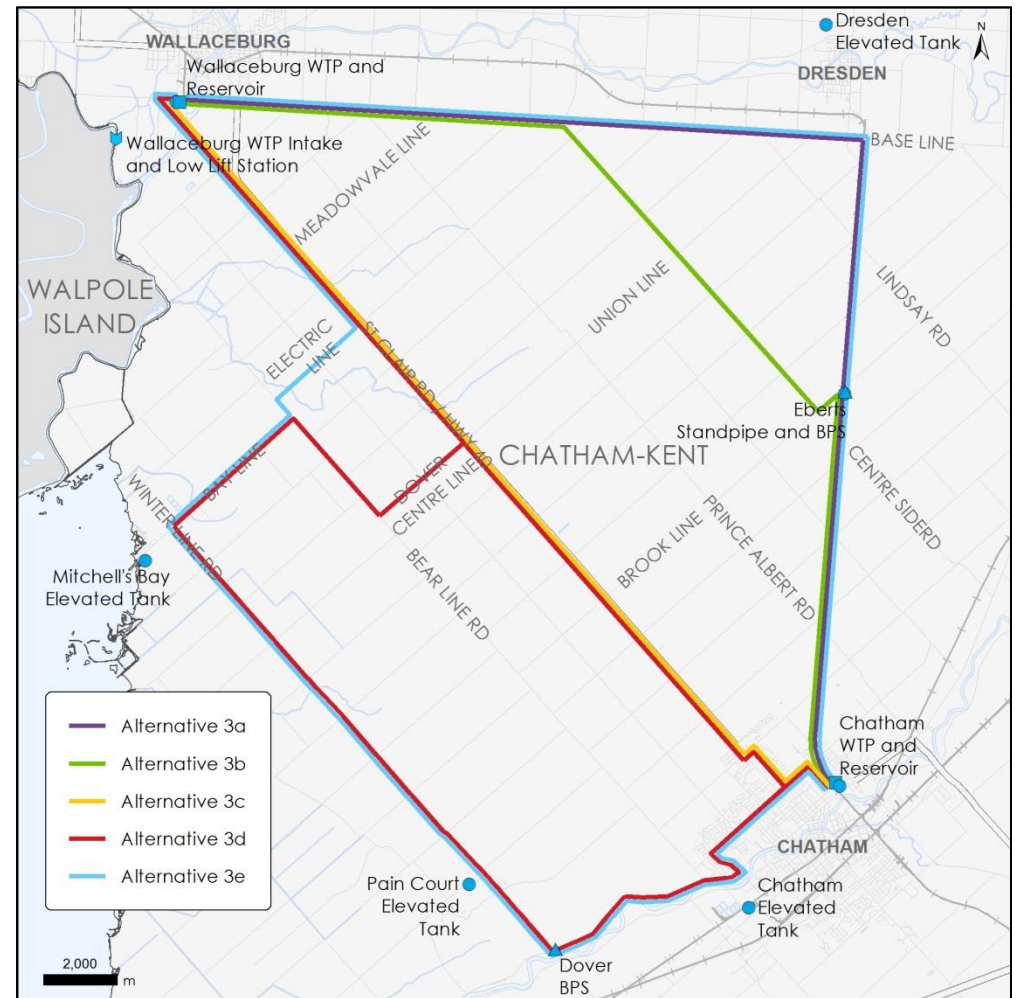
- Intake pipe & raw water transmission main identified as a high priority concern requiring immediate replacement
- Current intake location is often subject to shutdown due to spills: operational concerns and challenges associated with raw water quality
- New intake location within Chenal Ecarte or Sydenham River may be subject to similar raw water quality concerns
- Avoidance may require intake relocation to alternative water source (ie: Lake St. Clair or Lake Erie – would require long raw water transmission main and significant cost implications)
- New intake location would require a Class EA and regulatory approvals involving consideration of sensitive environmental areas
- Subject to Source Protection Planning technical study work and regulatory restrictions per approved Plan



Alternative Solution 3

Connect to the Chatham Drinking Water System

- a) Via Eberts Booster Pumping Station along Base Line
- b) Via Eberts Booster Pumping Station, along Centre Side Road and Base Line
- c) Along Highway 40 (St. Clair Rd)
- d) Via Highway 40 with interconnection from Mitchell's Bay
- e) Via Eberts Booster Pumping Station with interconnection from Mitchell's Bay

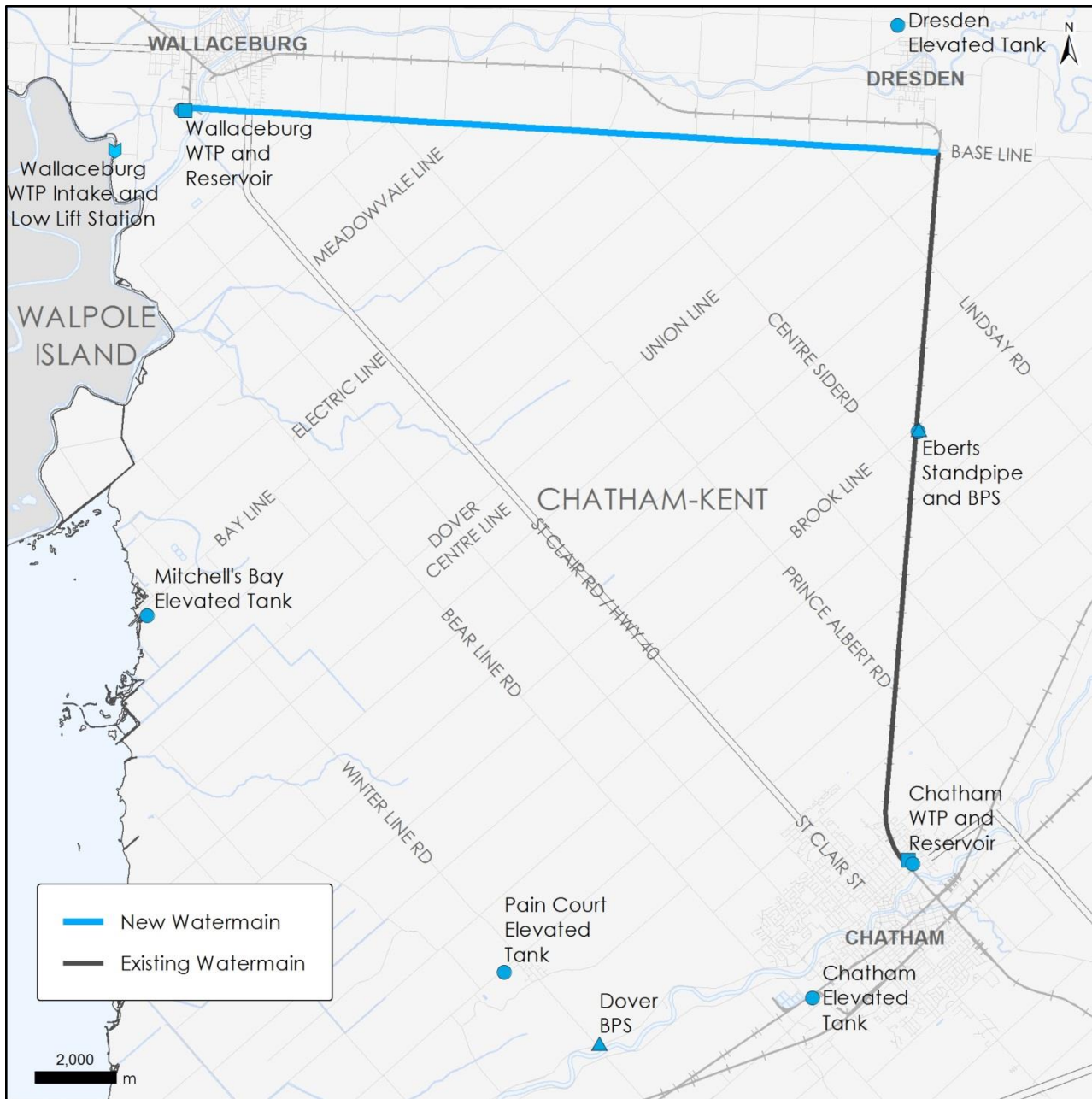


Alternative Solution 3

Connect to the Chatham Drinking Water System

- System has a higher rated capacity and can supply both distribution systems (consistent with 2012 Master Plan recommendation)
- Lake Erie intake is historically reliable, recent issues with blue – green algae, PUC has taken appropriate measures to handle at the Chatham WTP. Currently completing approximately \$1 M in ongoing upgrades to address taste & odour concerns (powdered activated carbon system to be completed by July 2015 and sodium permanganate system is now installed)
- Under this option, can provide up to current rated capacity of Wallaceburg WTP
- This option involves connection to existing storage and high lift pumping facilities
- The PUC owns the infrastructure and is in control of water rates, maintenance and upgrades

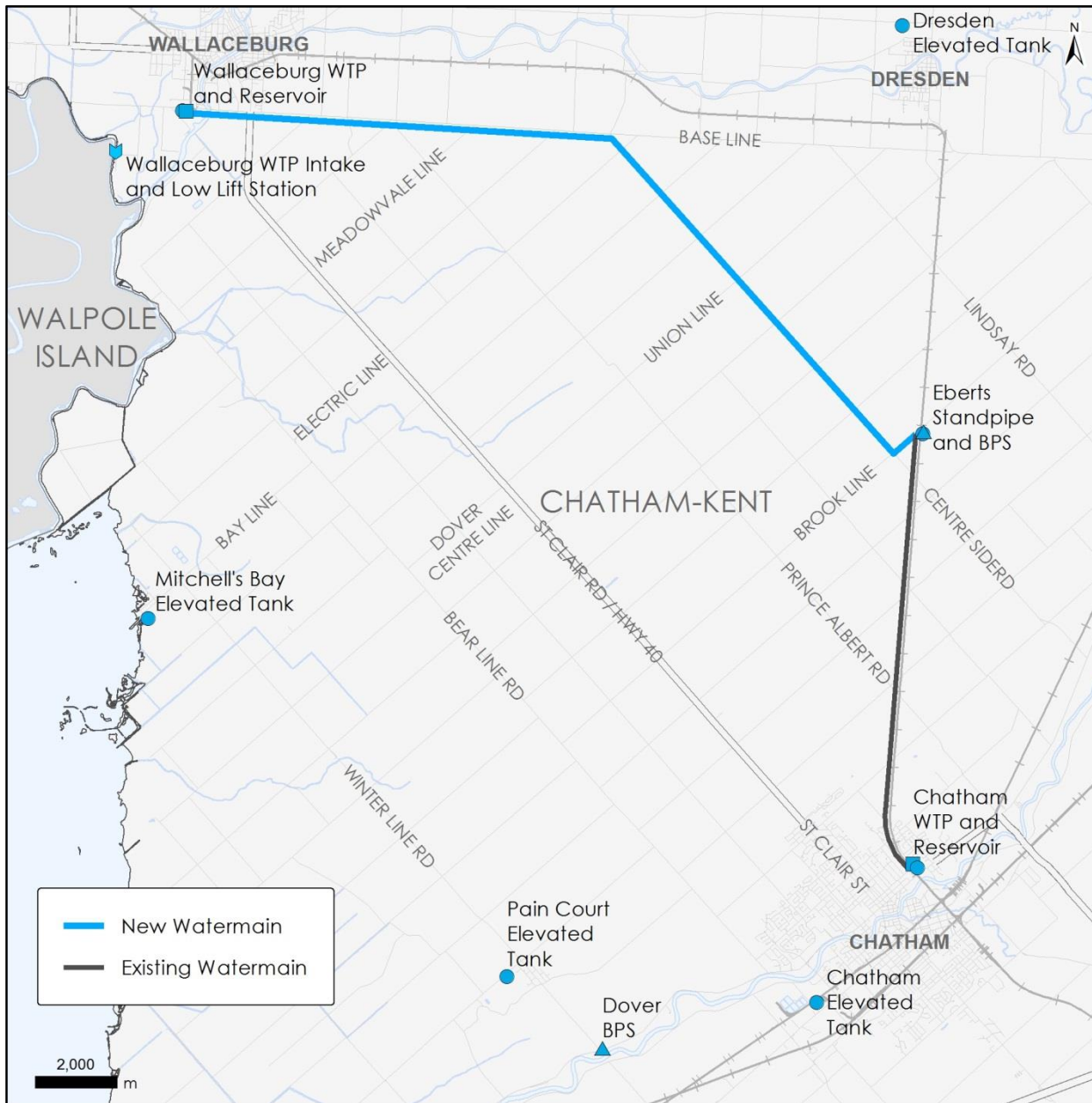




Alternative Solution 3a

Connect to the Chatham Drinking Water System

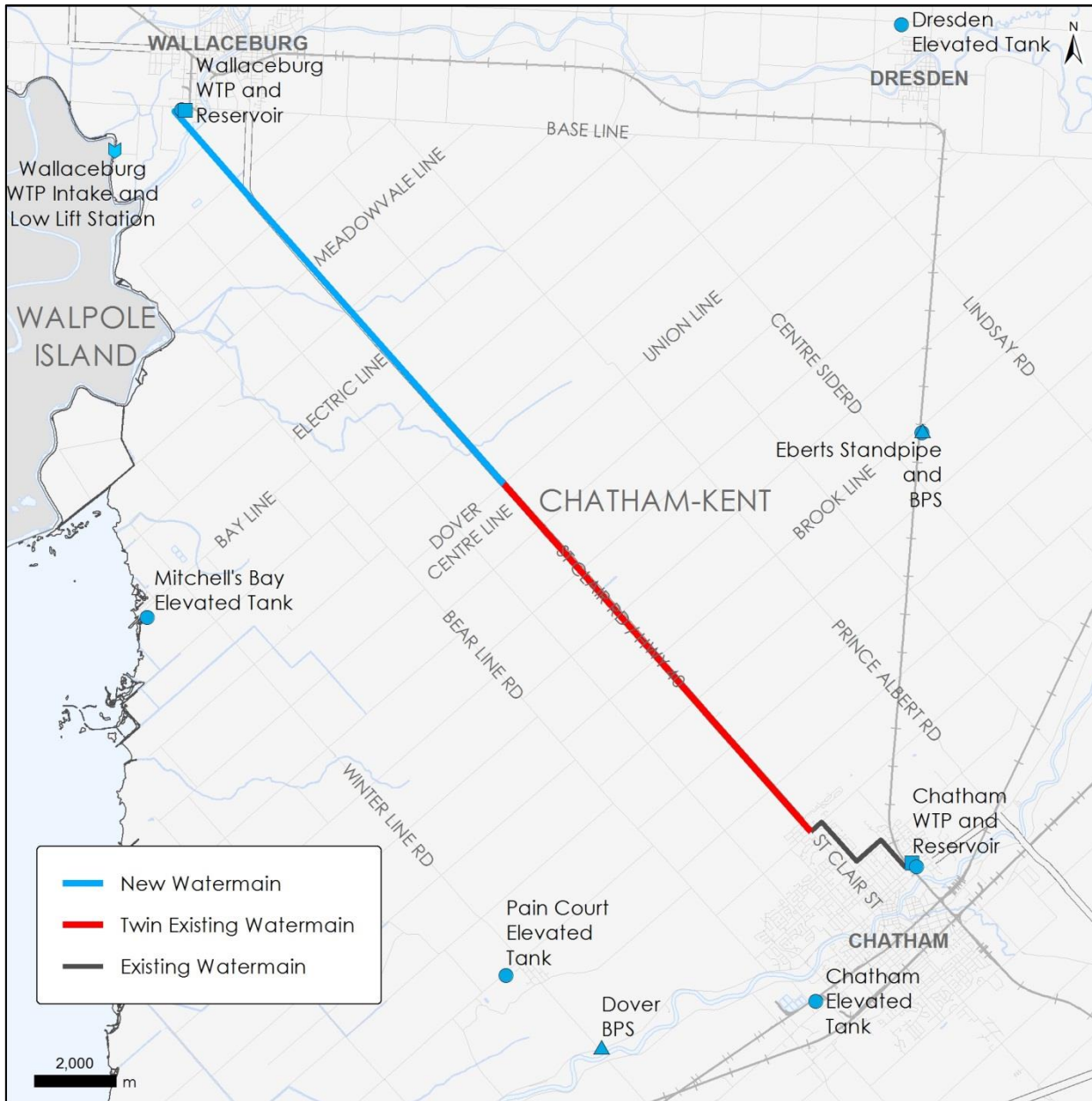
- Via Eberts Booster Pumping Station, along railway and Base Line
- Terminating at the WTP site
- New 500mm watermain extension for approximately 18km to match current capacity of Wallaceburg WTP



Alternative Solution 3b

Connect to the Chatham Drinking Water System

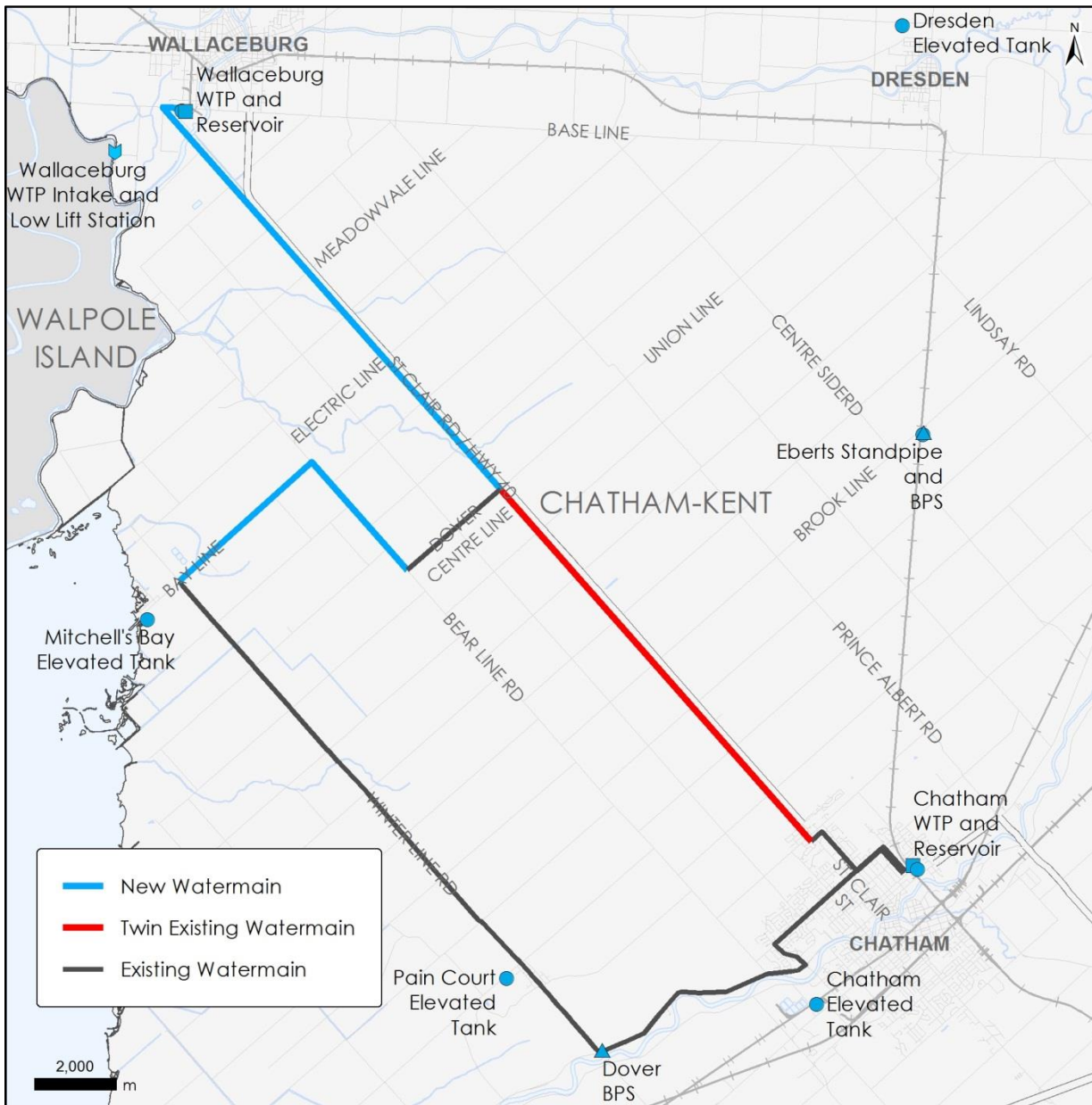
- Via Eberts Booster Pumping Station, along Centre Sideroad and Base Line
- Terminating at the WTP site
- Would require installation of 21.6 km of 500mm watermain to match current capacity of Wallaceburg WTP



Alternative Solution 3c

Connect to the Chatham Drinking Water System

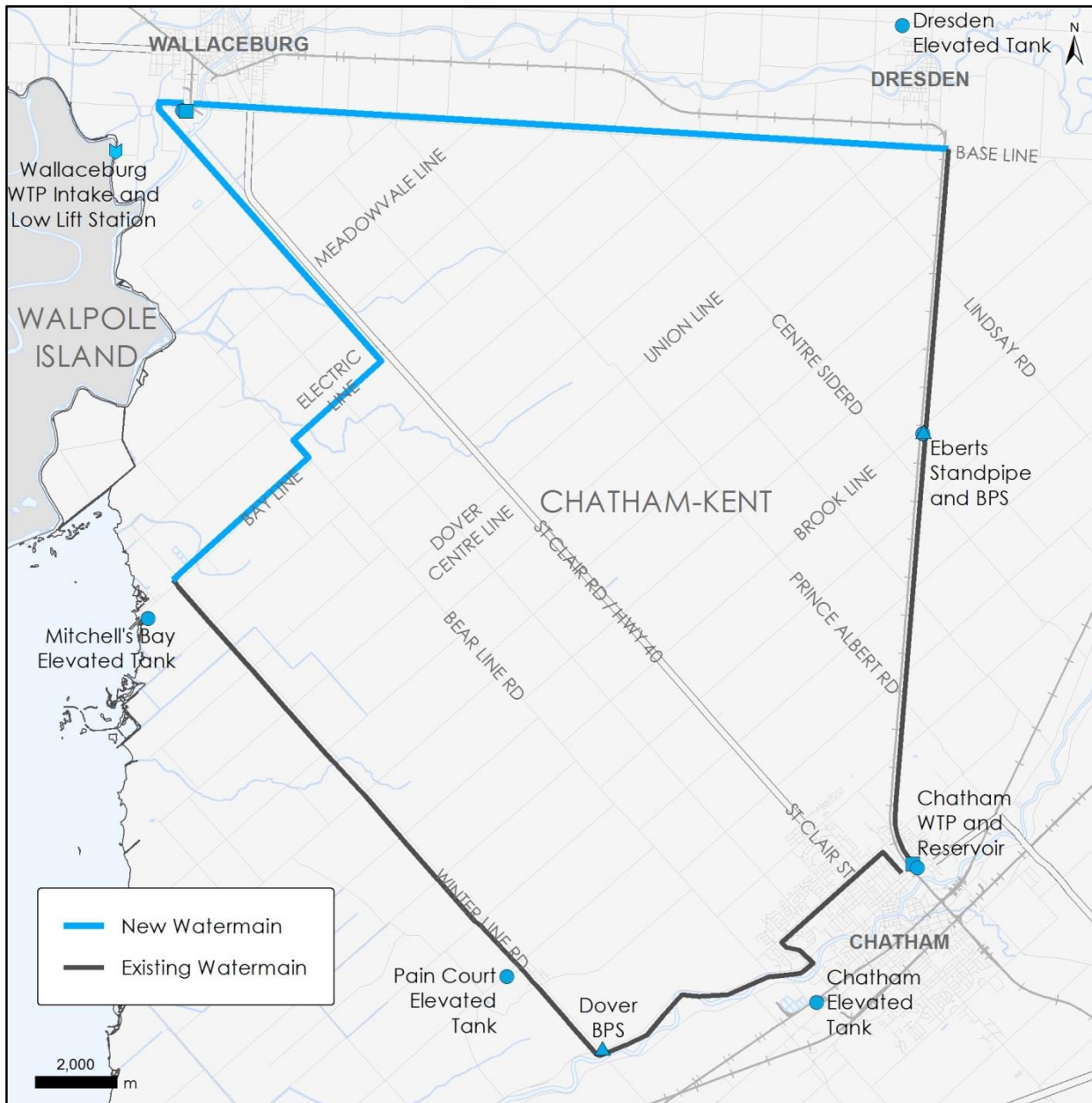
- Along Highway 40
- Terminating at the WTP site
- Would require new 12.7km of 600mm watermain and 11.3km of 500mm watermain (twinned along ex. 300mm watermain) to match current capacity of Wallaceburg WTP



Alternative Solution 3d

Connect to the Chatham Drinking Water System

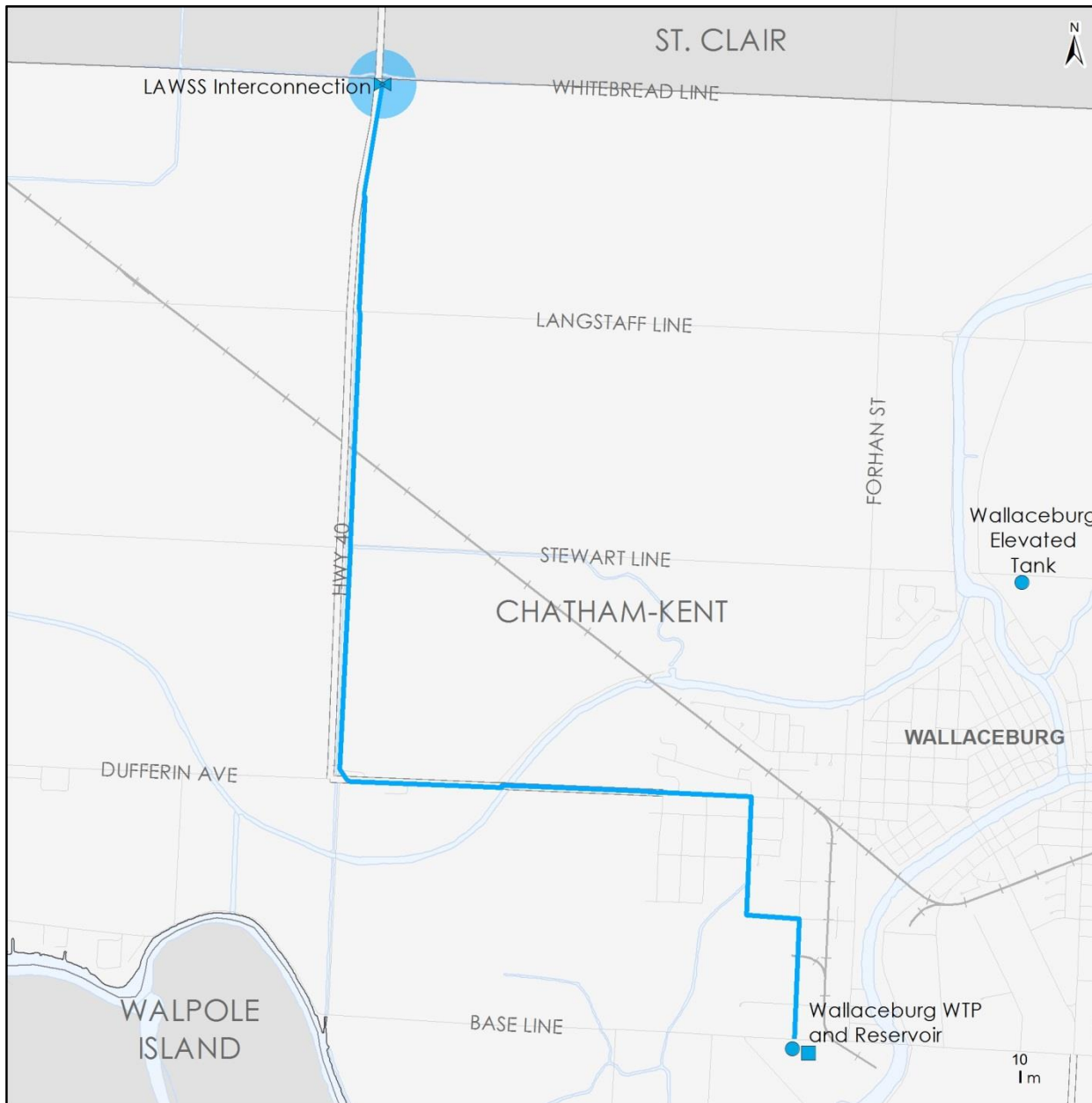
- Along Highway 40
- Additional loop to include Mitchell's Bay
- Terminating at the WTP site
- Would require new 24 km of 750mm watermain and 7.6 km 150mm watermain to match current capacity of Wallaceburg WTP



Alternative Solution 3e

Connect to the Chatham Drinking Water System

- Via Eberts Booster Pumping Station, along railway and Base Line
- Additional connection to include Mitchell's Bay
- Terminating at the WTP site
- Would require new watermains
- Existing watermains are undersized to provide adequate supply



Alternative Solution 4

Connect to the Lambton Area Water Supply System (LAWSS)

- Via existing emergency supply or possible new connection
- Does not have current capacity to supply Wallaceburg due to hydraulic bottlenecks in both systems
- PUC to accept costing to upgrade LAWSS system
- Requires review of Great Lakes Charter and Annex to assess inter-basin transfer restrictions

Environmental Review

Natural Environment

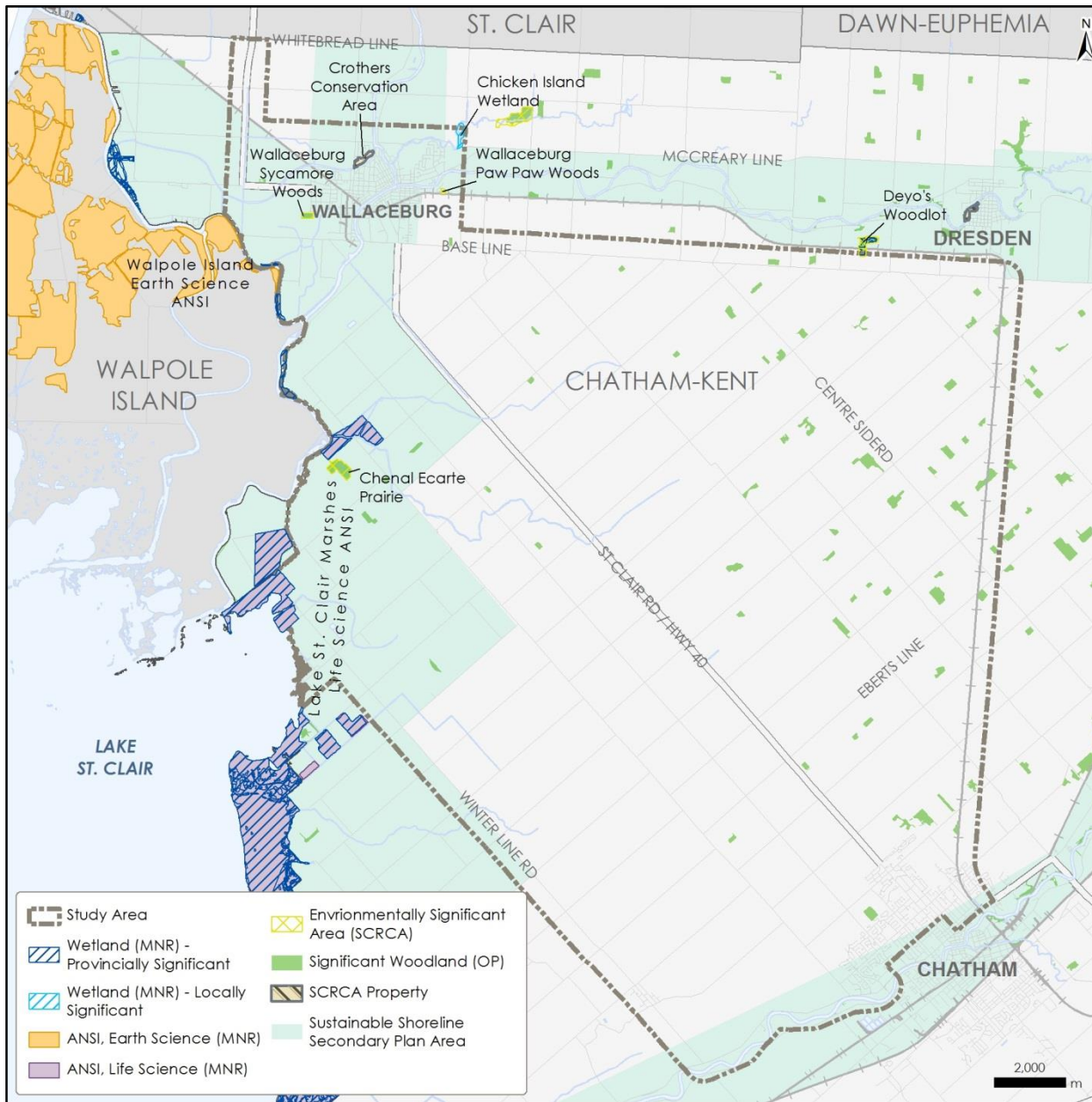
- Review natural areas for potential constraints (significant woodlots, wetlands, watercourses, etc.)
- Review current policies to ensure compliance with regulatory agencies
 - St. Clair Region Conservation Authority
 - Lower Thames Valley Conservation Authority
 - Ministry of Natural Resources
 - Department of Fisheries and Oceans

Social Environment

- Ensure public, agency and interested parties are consulted and incorporated into review process

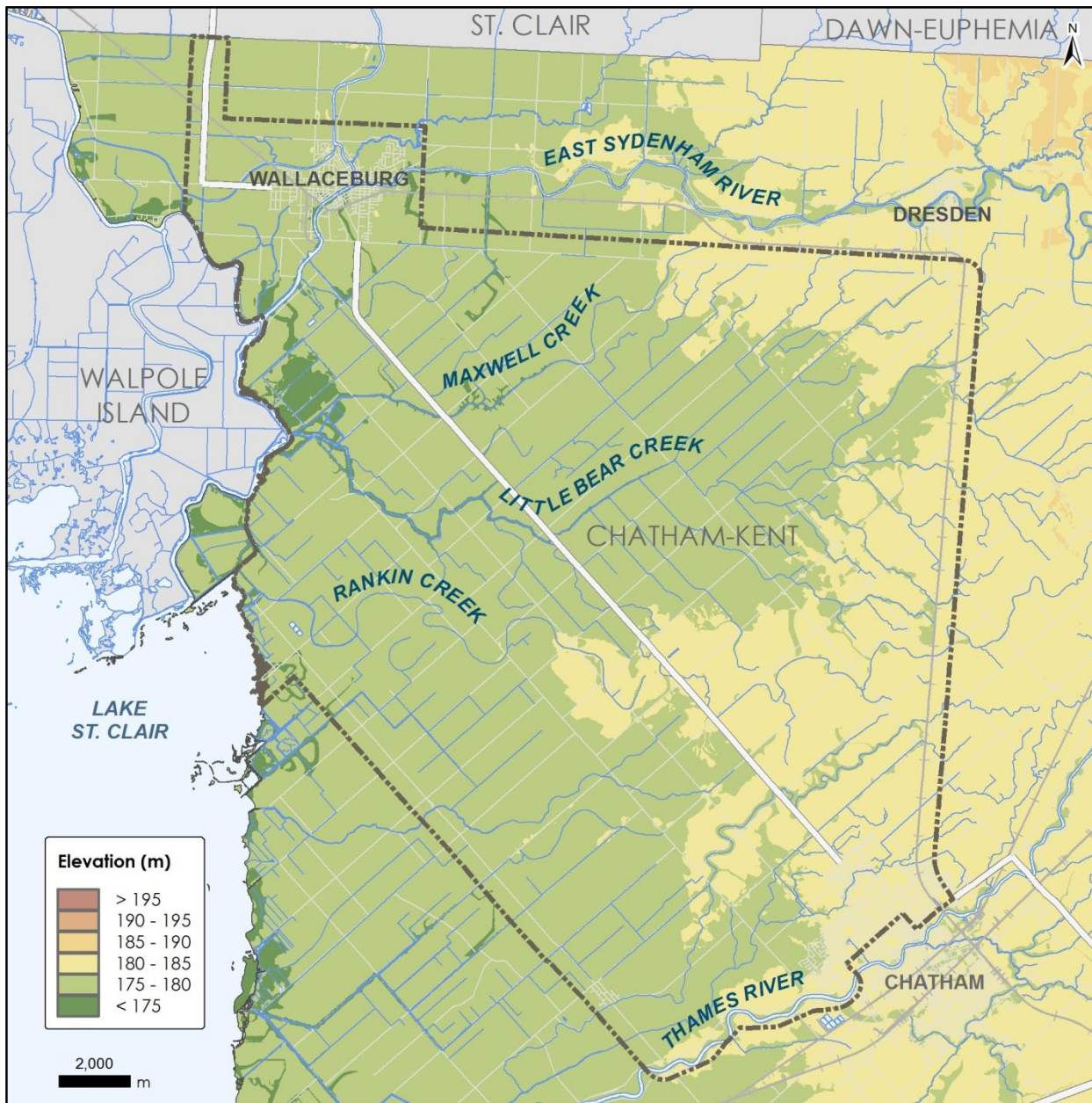
Economic Environment

- Incorporate potential cost factors in order to appropriately review project alternatives
- Consider both capital and operational costs (lifecycle costs)



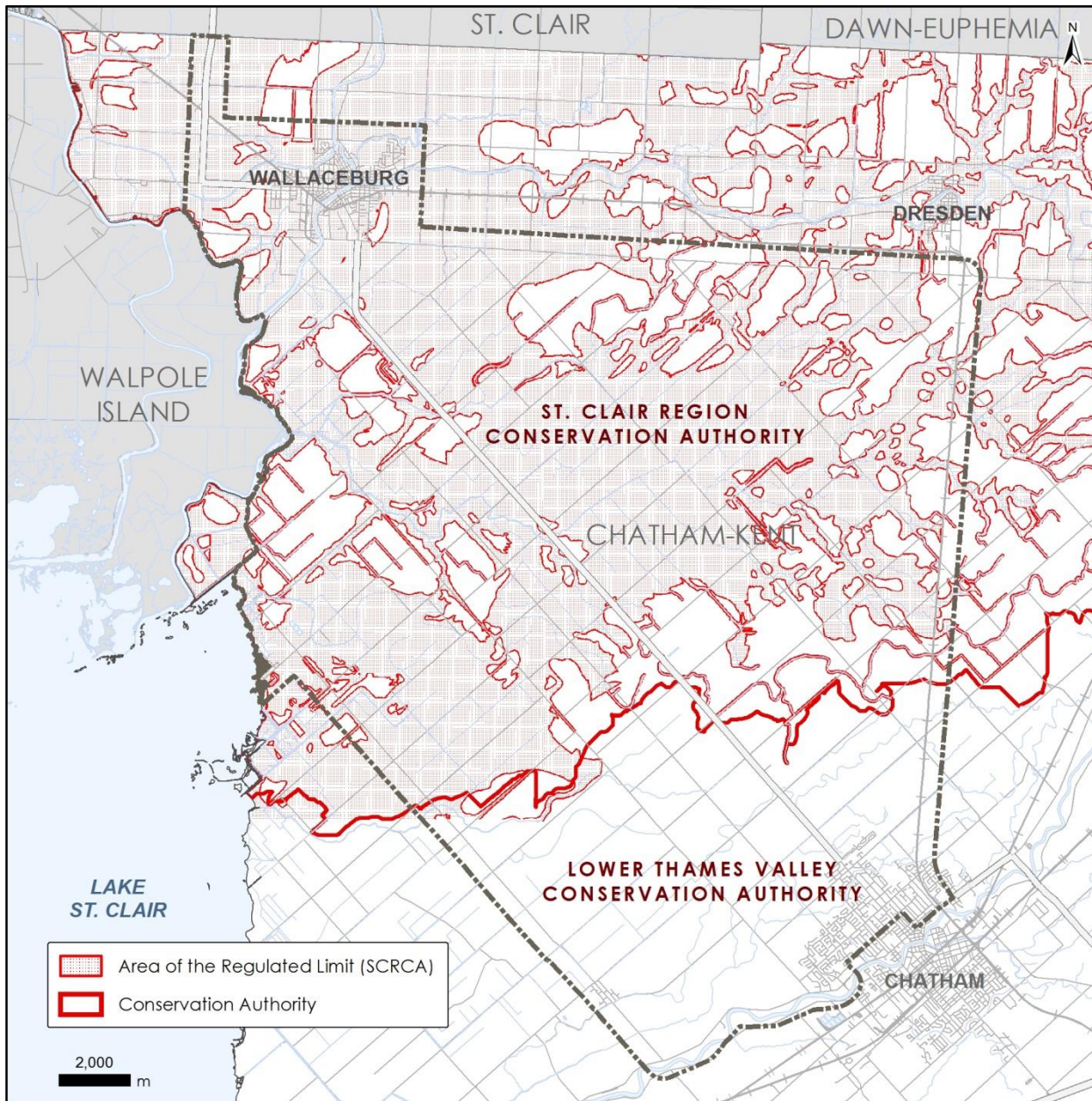
Natural Environment Features

- Construction within 50 metres of significant natural areas may require additional consultation and permitting
- Construction within 50 metres of significant natural areas may require additional field surveys to be completed



Natural Environment Features

- Topography impacts hydraulic considerations



Natural Environment Features

- Watercourses with sensitive species would likely need to be directionally drilled
- Construction within the Area of the Regulated limit may require consultation and permitting from appropriate Conservation Authorities

Evaluation of Alternatives

Option		Natural Environment Impacts	Social Environment Impacts	Economic Environment Impacts	Immediate 2014 Works - Opinion of Probable Cost*
1) Do Nothing		<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> Does not address Master Plan recommendations Reduced system security 	<ul style="list-style-type: none"> High treatment costs per m³ compared to Chatham WTP Higher maintenance costs than Options 3 and 4 	<ul style="list-style-type: none"> No capital financial expenditure for this option
2) Upgrade Existing WTP	Existing Intake	<ul style="list-style-type: none"> Impacts associated with construction activities 	<ul style="list-style-type: none"> Upgrading facility requires more effort to avoid service disruptions Concerns with upstream water quality not addressed 	<ul style="list-style-type: none"> High capital cost option Higher maintenance costs than Options 3 and 4 	<ul style="list-style-type: none"> Approximately \$3.4M in immediate works to rehabilitate the WTP with existing intake location Does not include additional lifecycle cost upgrades required beyond current year
	New Intake Location	<ul style="list-style-type: none"> Impacts associated with in-water works Construction impacts to surrounding sensitive areas Requires additional regulatory consultation and permitting 	<ul style="list-style-type: none"> Upgrading facility requires more effort to avoid service disruptions May address concerns with upstream water quality and security Source Protection Planning implications 	<ul style="list-style-type: none"> Highest capital cost option Requires additional technical studies and regulatory approvals 	<ul style="list-style-type: none"> Approximately \$3.4M plus new intake location study work and capital costs. Costing is unavailable as a separate Class EA will be required to locate a new raw water intake with cost analysis – cost is dependent upon intake location and complexity, potential for relocated Low Lift PS Does not include additional lifecycle cost upgrades required beyond current year
3) Connect to the Chatham Water Supply System		<ul style="list-style-type: none"> Impacts associated with construction activities to route new infrastructure Numerous watercourses to be reviewed for potential impacts 	<ul style="list-style-type: none"> May require Cultural and Archaeological studies Potential construction impacts to commuters and emergency services Capacity available in the system Alleviates water quality and quantity concerns from Chenal Ecarte Potential for system looping to improve distribution redundancy 	<ul style="list-style-type: none"> Lower maintenance costs than Options 1 and 2 Lower capital cost than Option 2 Control of water rates vs Option 4 where LAWSS rates govern costs Any work on Highway 40 requires permission and acceptance from the MTO All options require that the Wallaceburg WTP high lift pumps, reservoirs, and associated works are kept in service Consolidates operations, reducing costs Consistent with other Chatham-Kent regionalization initiatives 	Alt. 3a – Eberts BPS along Base Line: \$ 11.9M
					Alt. 3b – Eberts BPS along Centre Side Rd, Base Line: \$ 13.4M
					Alt. 3c – Along Highway 40: \$ 16.8M
					Alt. 3d – Along Highway 40 w/interconnection Mitchell's Bay: \$ 20.3M
					Alt. 3e – Eberts BPS w/interconnection Mitchell's Bay: NA – cannot provide adequate flow
4) Connect to the Lambton Area Water Supply System		<ul style="list-style-type: none"> Impacts associated with construction activities to route new infrastructure Numerous watercourses within the study area to be reviewed for potential impacts 	<ul style="list-style-type: none"> May require Cultural and Archaeological studies Potential construction impacts to commuters and emergency services Alleviates water quality and quantity concerns from Chenal Ecarte Capacity available at the LAWSS WTP 	<ul style="list-style-type: none"> Unknown maintenance costs System won't be able to support Wallaceburg needs without significant upgrades to both LAWSS and Wallaceburg Infrastructure Control on water rate cost is unknown 	<p>Significant upgrades to LAWSS piping would be required in order to be technically feasible. Further discussion with LAWSS is required to determine allowable extent of upgrades to maintain desired service. Preliminary estimate cost of \$20M excluding connection costs and additional upgrades to LAWSS pumping station facilities to meet only projected max day demand of 92 L/s (below rated capacity of Wallaceburg WTP). This option will also require a Booster PS. Also, consideration of Great Lakes Charter and Annex (2001) will be required.</p>

*Opinion of probable cost is based upon Class D estimate per Public Works Canada guidelines. All costs are based upon estimates using 2014 dollars.

Evaluation of Alternatives

Connect to the Chatham Drinking Water System									
Evaluation Criteria	Alternative 1 – Do Nothing	Alternative 2a – Rehabilitate the Existing WTP using Existing Intake	Alternative 2b – Rehabilitate the Existing Intake using New Intake Location	Alternative 3a – Via Eberts BPS along Base Line	Alternative 3b – Via Eberts BPS along Centre Side Rd and Base Line	Alternative 3c –Along Hwy 40	Alternative 3d – Via Hwy 40 with interconnect from Mitchell’s Bay	Alternative 3e – Via Eberts BPS with Interconnect from Mitchell’s Bay	Alternative 4 – Connect to LAWSS
Capital Cost (2014)	Option not feasible. Cost analysis not undertaken.	\$3.4M (refer to Note A)	\$3.4M + (refer to Note C)	\$11.9M	\$13.4M	\$16.8M	\$20.3M	Refer to Note D	Significant upgrades to both systems would be required in order to be technically feasible. Refer to Note E
Operating & Maintenance Cost		~\$780K/year (refer to Note B)	~\$780K/year (refer to Note B)	~\$250k/yr	~\$250k/yr	~\$175k/yr	~\$175k/yr		
20-year Life Cycle Cost (2014 \$)		~\$27.5M	\$27.5M+ (refer to Note C)	~\$19.7M	~\$21.3M	~\$22.7M	~\$26.2M		
40-year Life Cycle Cost (2014 \$)		~\$67.2M	\$67.2M+ (refer to Note C)	~\$37.5M	~\$39.1M	~\$37.7M	~\$41.2M		

Note A – Cost to refurbish the WTP in 2014 not including partitioned O&M costs.

Note B – Only reflects operational cost as the maintenance costs have been allocated in annual capital upgrade forecasting.

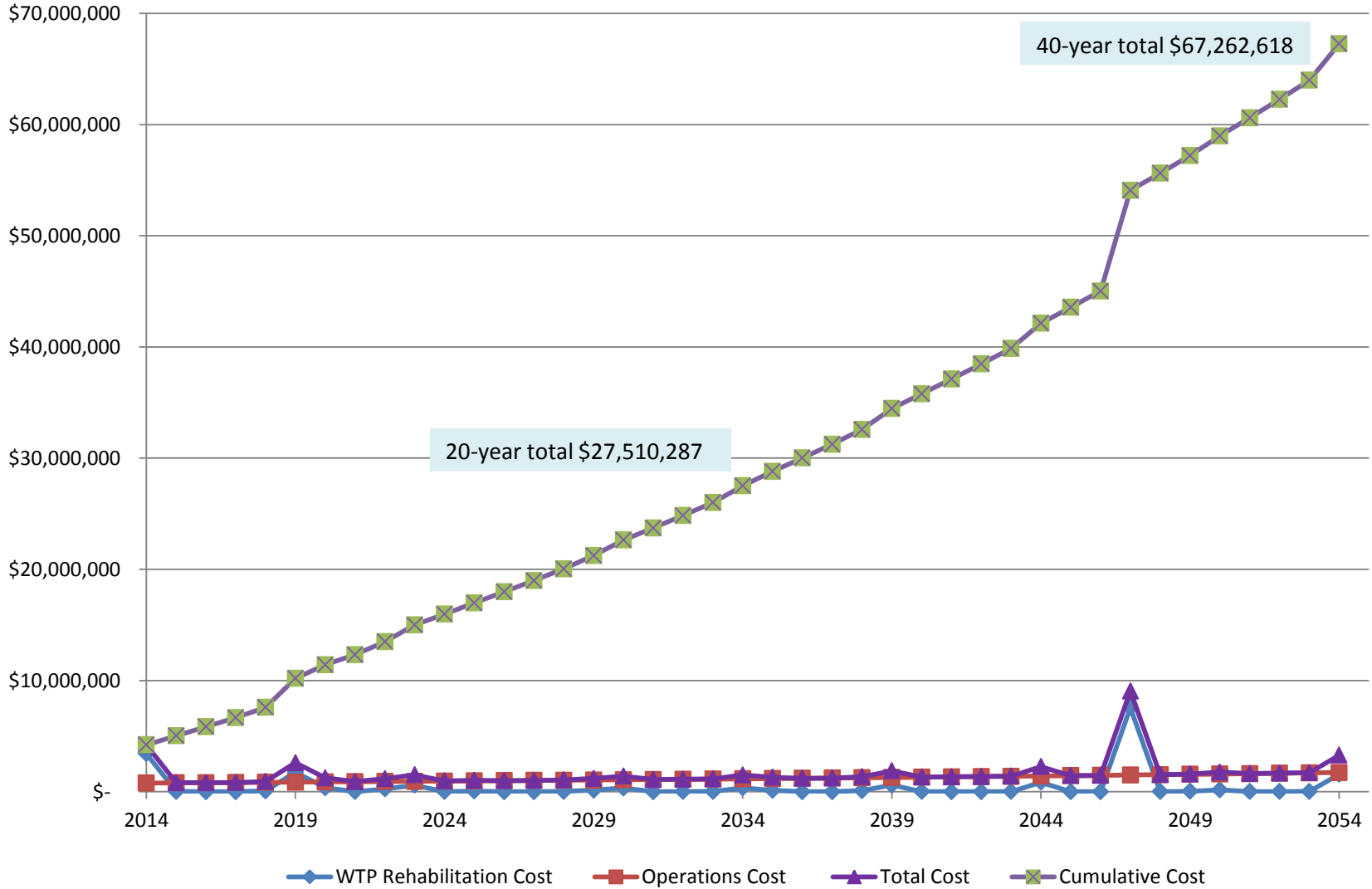
Note C –Cost for a new intake location is dependent upon the location, which has yet to be determined, and is not possible at this time.

Note D – This option was not technically feasible as existing conditions for water supply cannot meet the demand. Costing was not provided.

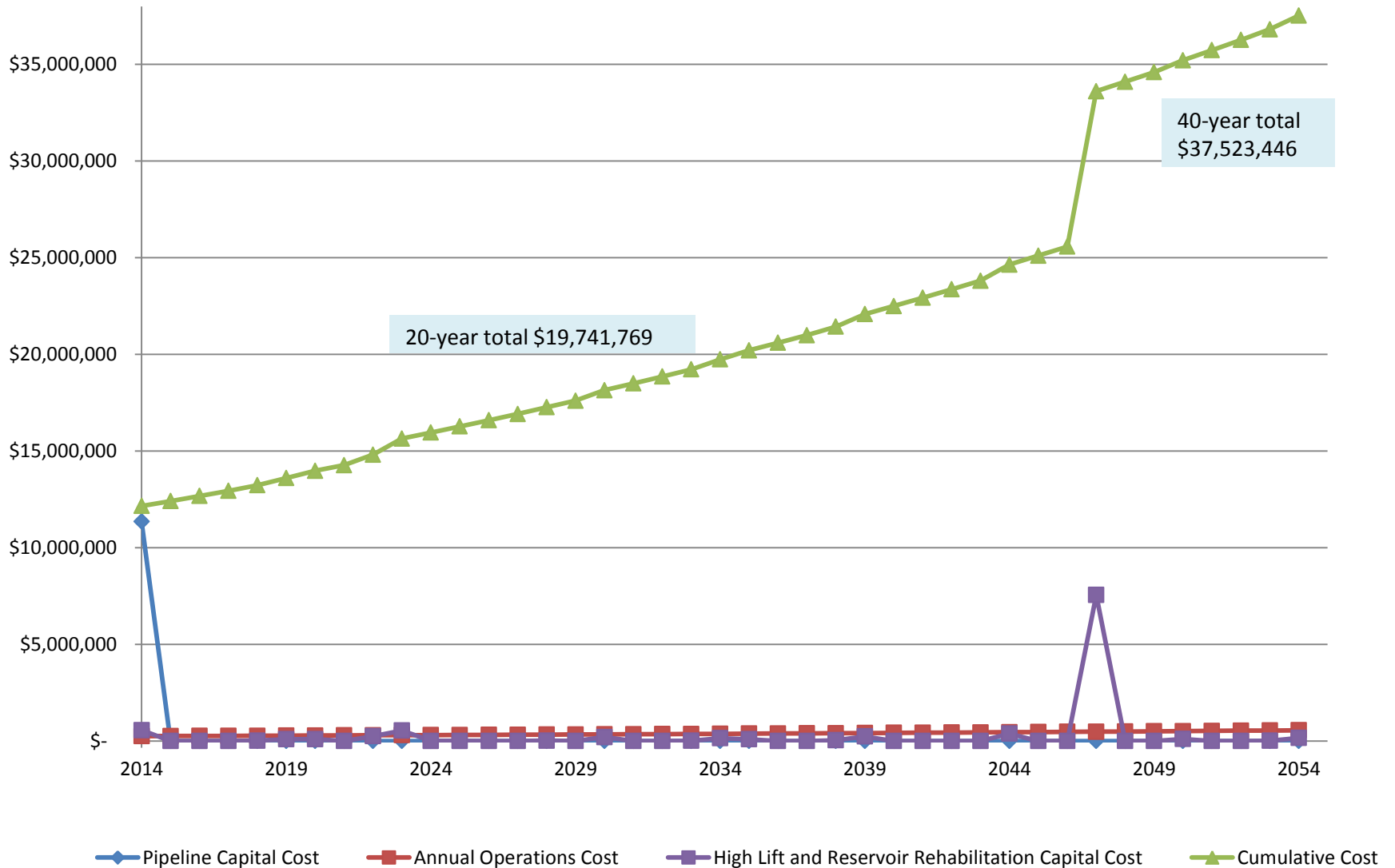
Note E – This option will require upgrades to both the LAWSS system and Wallaceburg system to meet the demand. The extent of these upgrades relies on cost sharing and scope of LAWSS upgrades required for this option to be feasible.

General – Capital costs for Alt. 3 all include Wallaceburg WTP high lift pumps and reservoir costs required in 2014. All flows in Alt. 3 based on meeting current Wallaceburg WTP capacity. Opinion of probable cost is based upon Class D estimate per Public Works Canada guidelines. All costs are based upon estimates using 2014 dollars.

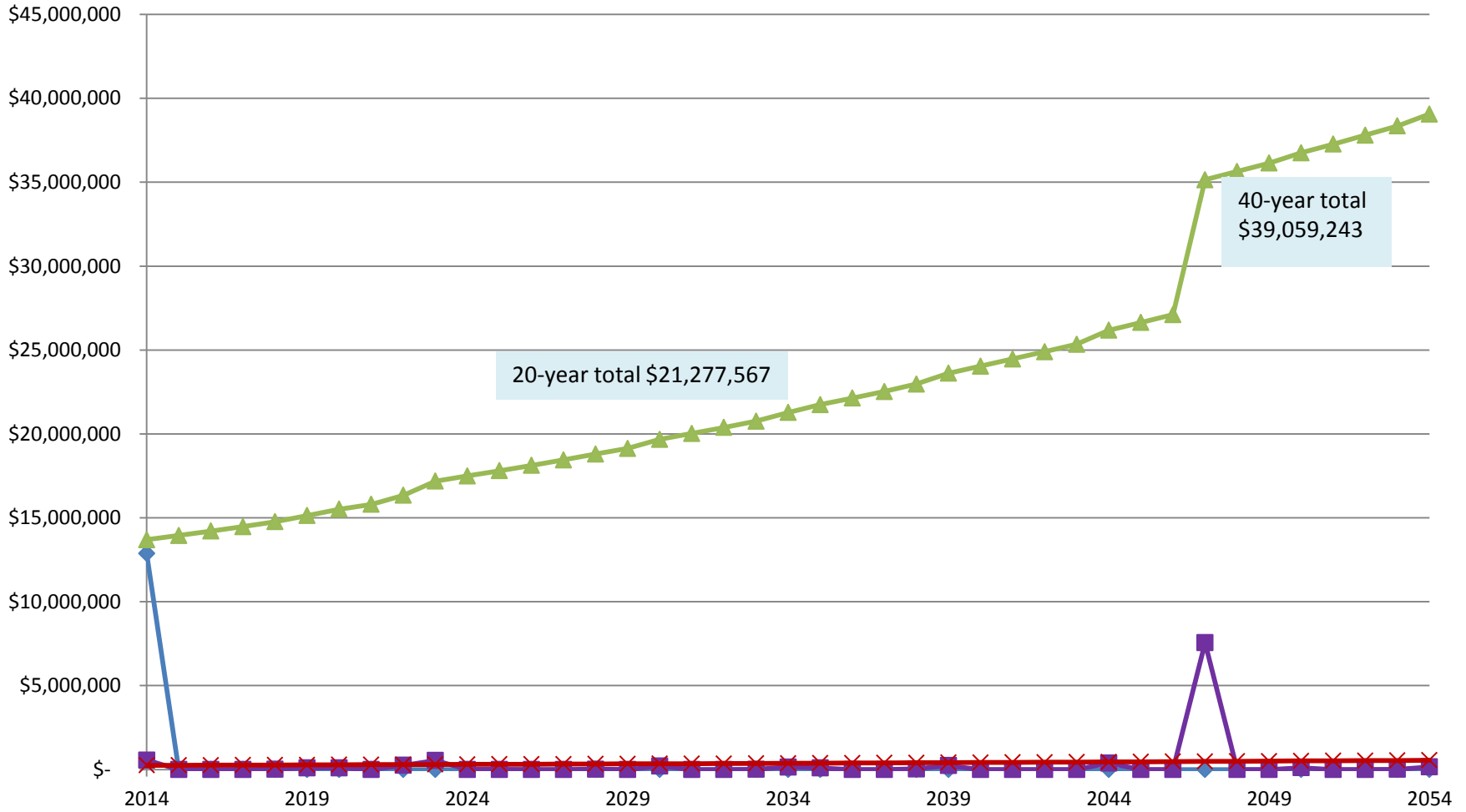
Alternative 2a - Rehabilitate Wallaceburg WTP



Alternative 3a: Connect to Chatham Drinking Water System Via Eberts BPS Along Base Line

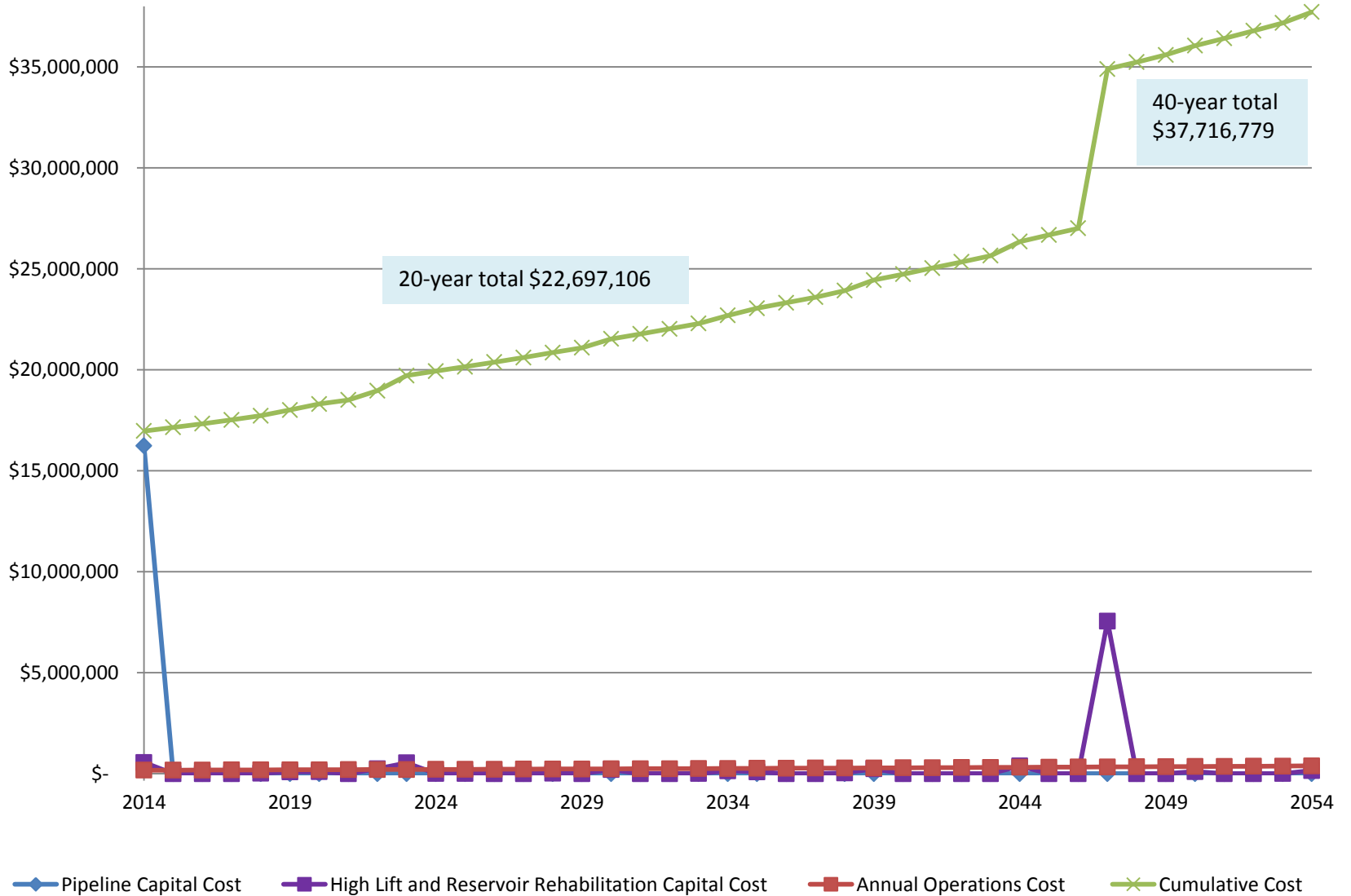


Alternative 3b: Connect to Chatham Drinking Water System Via Eberts BPS Along Centre Side Rd. and Base Line

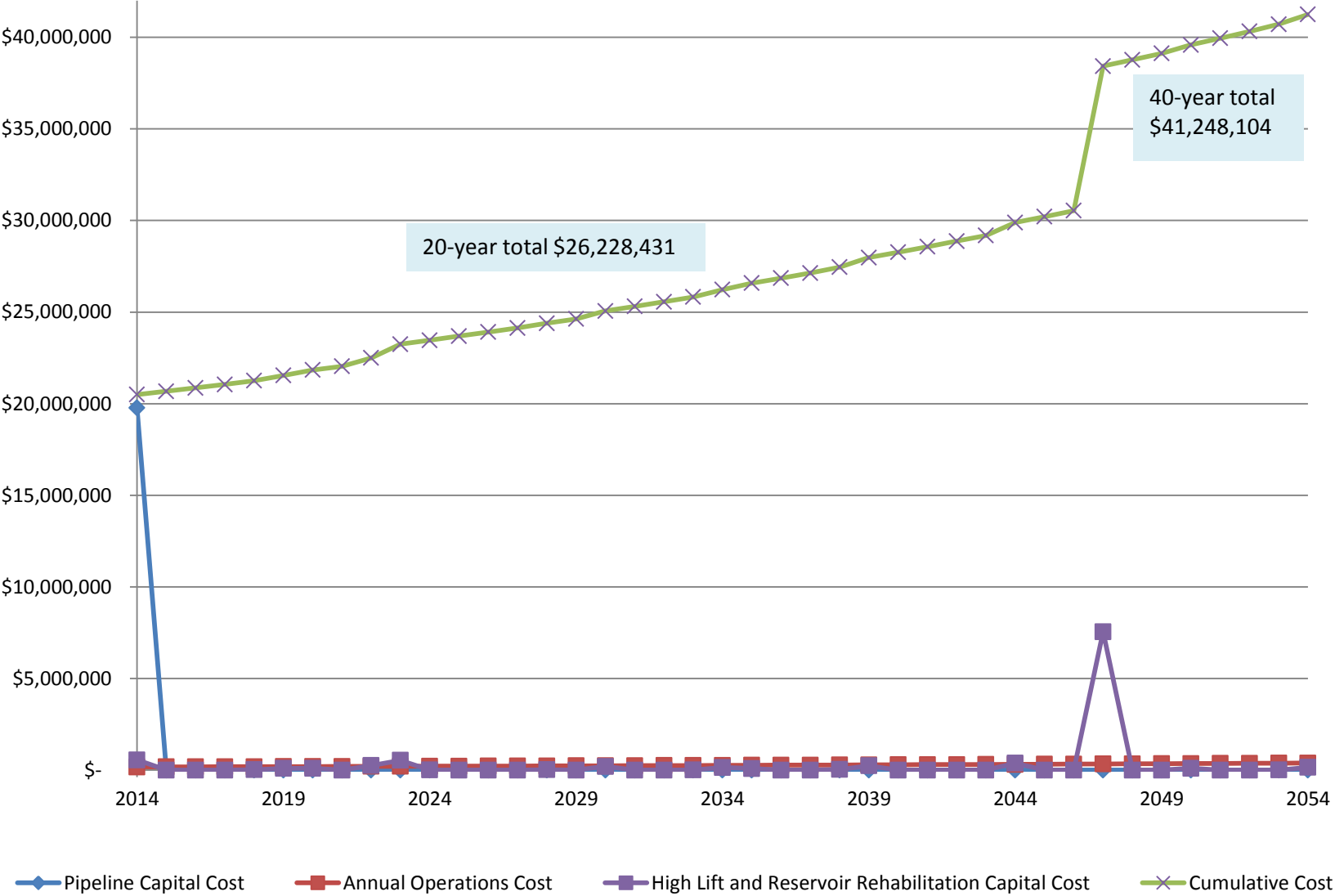


◆ Pipeline Capital Cost
 ■ High Lift and Reservoir Rehabilitation Capital Cost
 ✕ Annual Operations Cost
 ▲ Cumulative Cost

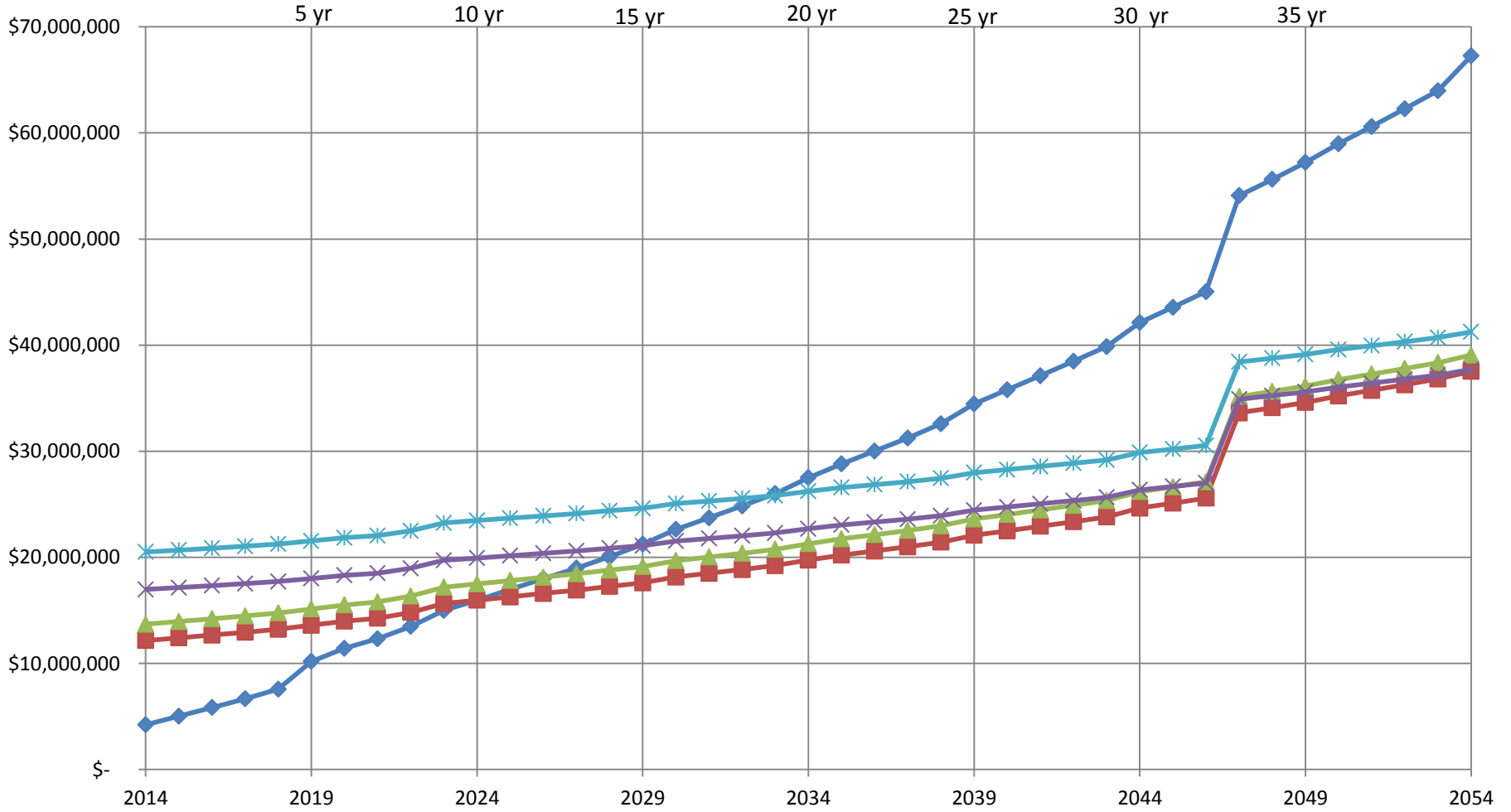
Alternative 3c: Connect to Chatham Drinking Water System Along Highway 40



Alternative 3d: Connect to Chatham Drinking Water System Via Highway 40 with Interconnection from Mitchell's Bay



Cumulative Cost for Each Alternative



- ◆ Alternative 2a: Rehabilitate the Existing WTP using the Existing Intake
- Alternative 3a: Connect to Chatham Drinking Water System Via Eberts BPS Along Base Line
- ▲ Alternative 3b: Connect to Chatham Drinking Water System Via Eberts BPS Along Centre Side Rd. and Base Line
- ✕ Alternative 3c: Connect to Chatham Drinking Water System Along Highway 40
- ✱ Alternative 3d: Connect to Chatham Drinking Water System Via Highway 40 with Interconnection from Mitchell's Bay

Lifecycle Cost Ranking

Alternative	2014 Capital Cost	20 Year Cumulative Cost (Capital + O&M)	40 Year Cumulative Cost (Capital + O&M)	Lifecycle Cost Ranking
Alternative 2a: Rehabilitate the Existing WTP using the Existing Intake*	\$ 3,430,800	\$ 27,510,287	\$ 67,262,618	Highest
Alternative 3a: Connect to Chatham Drinking Water System Via Eberts BPS Along Base Line	\$ 11,906,940	\$ 19,741,769	\$ 37,523,446	Lowest
Alternative 3b: Connect to Chatham Drinking Water System Via Eberts BPS Along Centre Side Rd. and Base Line	\$ 13,442,738	\$ 21,277,567	\$ 39,059,243	Third Lowest
Alternative 3c: Connect to Chatham Drinking Water System Along Highway 40	\$ 16,796,025	\$ 22,697,106	\$ 37,716,779	Second Lowest
Alternative 3d: Connect to Chatham Drinking Water System Via Highway 40 with Interconnection from Mitchell's Bay	\$ 20,327,350	\$ 26,228,431	\$ 41,248,104	Fourth Lowest

*Alternative 2b is the same base cost PLUS cost of new intake

Preferred Alternative

Based on Technical and Environmental Evaluations, Alternative 3 - Connect to the Chatham Water Supply System, is the preferred alternative

Further technical review will determine the preferred design solution for this alternative.

Next Steps

- **Review submitted comments**
- **Hold PIC 3 to present the preferred design solution**

Communications

To provide your comments, please fill out a comment sheet and place in the Comment Box at today's meeting or send to one of the persons below.

Chatham – Kent Public Utilities Commission

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