Carla,

Per your request, I have prepared estimates for the environmental related costs that the City will incur while maintaining the utilities within the West Calumet Housing Complex and Carrie Gosch Elementary School (Operable Unit 1). In addition to the incremental costs that are related to the maintenance and repair of the existing utilities, I have made some estimates for additional costs that would be incurred for work related to any demolition of housing units, or paved/concrete areas. I trust that this meets your immediate needs.

To complete the repair activities in general accordance with the Weaver Boos Work Plan, each repair will require the collection of a waste profile sample for disposal acceptance at a permitted facility; storage, transportation and disposal of lead and/or arsenic impacted soils; collection and analysis of confirmatory soil samples from each completed excavation; and the preparation of a final environmental closure report for each excavation to document the completed remediation. The additional costs for these tasks are estimated to range from $5,000 for a small removal (assumed 18 cubic yards) to an additional $8,620 for a larger removal (assumed 60 cubic yards). Our typical contractor repair costs for maintaining the utilities average $18,420 (average based upon Purchase Orders for 2015 and 2016). The additional environmental costs represent increases of 27% and 47% of the current average, depending if they result in a small or large removal, respectively.

The above calculation provides a rough estimate of the magnitude in increased costs for addressing repairs and maintenance on a case by case basis. However, the City of East Chicago will incur additional costs indefinitely to address lead impacted soils at the West Calumet Housing project. To develop an overall cost estimate that would encompass the remediation of areas associated with all sanitary, storm and water utilities, as well as impacted soils beneath roadways, sidewalks and buildings, a rough calculation of the length of utilities in place and the area covered by buildings, concrete and/or pavement has been developed and is summarized below.

- Sanitary Sewers -approximately 9,700 linear feet or 1.8 miles, 12" to 18" diameter at depths ranging from 5.3' to 9.9'
- Storm Sewer – approximately 3,300 liner feet or 0.6 miles, 18" to 42' diameter at depths ranging from 4.5' to 7.8'
- Water main & service connections - approximately 14, 180 linear feet or 2.7 miles
- Roads – approximately 6,780 linear feet or 1.3 miles, approximately 38 feet wide, covering 257,640 ft^2
- Sidewalk/paved walkways – approximately 2,845 linear feet or 0.5 miles, approximately 12 feet wide covering 34,140 ft^2
- Parking areas 179,250 ft^2
- Residential buildings, 138 units at approximately 1500 square foot each
- Two "Y-shaped" apartment complex buildings, 21,000 square foot each
- One apartment building, 7,500 square foot

Assuming that the entire lengths of the installed utilities will need to be addressed at some point in time, the incremental costs for the transportation and and disposal for each utility service are estimated as follows:

Sanitary Sewers	291,000 cubic yards for disposal	$1,050,000
Storm Sewers	79,200 cubic yards for disposal	$ 286,000
Water service connections	170,160 cubic yards of disposal	$ 615,000
	Transportation & Disposal related costs	$1,951,000

Additional costs will also be incurred during the maintenance, repair, or replacement of the paved roadways, sidewalks, parking lots within the complex. The estimated transportation and disposal costs of impacted soil that would be addressed for these areas, assuming an excavation to three feet in each of these areas would be as follows:

Roads	28,630 cubic yards for disposal	$2,791,000
Sidewalks, paved areas	3,800 cubic yards for disposal	$ 370,000
Parking areas	19,916 cubic yards for disposal	$1,942,000
	Transportation & Disposal related costs	$5,103,000

Should any of the structures be demolished for future development, the increased transportation and disposal costs for these activities are estimated as follows:

Residential units	23,000 cubic yards for disposal	$2,243,000

Apartment complexes	5,500 cubic yards for disposal	$ 536,000
	Transportation and Disposal related costs	$2,779,000

To summarize, the additional transportation and disposal costs that may be incurred during the eventual repair or replacement of the utilities, infrastructure and buildings at the West Calumet Housing project is estimated as follows:

Utility replacements	$ 1,951,000	
Road/ Paved area replacements	$ 5,103,000	
Building replacements	$ 2,779,000	
	$ 9,833, 000	Transportation and Disposal fees

To account for the additional costs for the collection of confirmatory samples, additional health and safety requirements, preparation of documentary reports for the closure of each remediation completed, other related administrative and legal costs that would be incurred for these related actions, and other unforeseen costs, a contingency of 25% of the total estimated transportation and disposal costs ($2,195,000) was assumed accounting. Adding this 25% contingency amount to the total transportation and disposal cost estimate, the total estimated incremental costs that may be incurred for the environmental impacts at the West Calumet Housing complex is estimated as:

$ 9,833,000	Transportation and Disposal fees
$ 2,458,000	25% contingency
$12,291, 000	**Estimated Total Environmental Costs**

Please note that this is a rough cost estimate using the data available at hand based upon current 2016 rates and not adjusted for future inflation. This ball park estimate should be only used as a general discussion point and should be developed in greater detail if it is to be used as an actual estimate of future costs.

I trust that this meets your immediate needs. Please call me if you have any questions.