Message

From: Smeraldi, Josh [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=7011C5F0ADAB4BDC860A26380510F40B-SMERALDI, J]
Sent: 7/2/2020 1:51:19 PM
To: Sivak, Michael [Sivak.Michael@epa.gov]
Subject: FW: Explanation on Present Worth

Info on costs below. We can talk about this in our meeting later

From: AccardiDey, AmyMarie <AmyMarie.Accardi-Dey@wsp.com>
Sent: Thursday, July 2, 2020 8:55 AM
To: Smeraldi, Josh <Smeraldi.Josh@epa.gov>
Subject: Explanation on Present Worth

Sent from my iPhone

Begin forwarded message:

> **From:** "Bailey, Sharon L" <sharon.bailey@wsp.com>
> **Date:** July 1, 2020 at 2:18:44 PM EDT
> **To:** "AccardiDey, AmyMarie" <AmyMarie.Accardi-Dey@wsp.com>
> **Subject: RE: Question from EPA on Riverside Proposed Plan**

You probably know most or all of this but this gives you something you can pass on.

The net present worth (or net present value) is the sum of the present worth of a string of costs associated with the project. Some of these costs may occur in a single year while others will occur over a number of years. A discount rate (i.e., interest rate) is used to convert different types of project costs (capital, annual, periodic) occurring over different periods of time to a single number that can be used for comparison purposes. The discount rate varies based on the project (source: http://www.investopedia.com/terms/d/discountrate.asp).

> *The discount rate also [**sic**] refers to the interest rate used in discounted cash flow (DCF) analysis to determine the present value of future cash flows. The discount rate in DCF analysis takes into account not just the time value of money, but also the risk or uncertainty of future cash flows; the greater the uncertainty of future cash flows, the higher the discount rate.*

In general, the higher the discount rate, the lower the present value of future cash flows; the lower the interest rate, the higher the present value. A remedial alternative is determined to be cost-effective if, on the basis of life cycle cost analysis of competing alternatives, it is determined to have the lowest costs expressed in present value terms, assuming all other (i.e., non-financial) criteria are met or factored into the analysis. EPA guidance suggests the use of a 7% discount rate unless documentation can be provided supporting the use of another rate.

The timing of expenditures has a significant impact on the PW calculations. For smaller projects, such as those for the sewer or tank removal tasks, the capital costs may occur in a single year. However, for larger projects such as those with significant predesign and design activities or with large capital costs that are unlikely to occur in a single construction season, the capital costs will be spread out over several years. This will be true with the soil fill (SF), soil gas (SG) and groundwater (GW) alternatives.

The original costs estimates provided by PPG assumed all capital costs occurred in year 2020, even for larger projects (SF, SG and GW). This is unrealistic given the required activities prior to implementing the tasks. In the revised FFS, an implementation schedule was developed spreading out the capital costs for the SF, SG, and GW alternatives over several years (generally 2 to 5 years) to reflect the likely timing of various work elements (predesign, design, construction, construction oversight, etc.). For all tasks, work was assumed to start in 2021. Once the schedule was established for each task, the present value for each was calculated using the built-in formula in excel (NPV) for calculating the present value of a series of investments with a set discount rate (7%). The implementation schedule used for the various elements of each task is shown in the Tab marked Present Value calculations.

The method used to calculate the present worth for the Riverside project is the same approach that was used on the Lower Passaic River (Diamond Alkali OU2 project).

Note – links/calculations were removed from the spreadsheet because it is very easy to mess up the calculations if modifying the base tables resulting in an erroneous answer that is difficult to troubleshoot.

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From: AccardiDey, AmyMarie <AmyMarie.Accardi-Dey@wsp.com>
Sent: Wednesday, July 1, 2020 6:34 AM
To: Bailey, Sharon L <sharon.bailey@wsp.com>
Subject: Question from EPA on Riverside Proposed Plan

Sharon – EPA sent the following question to us on the Riverside Proposed Plan that they are preparing:

"We are getting a lot of comments on the costs questioning why, for many of the alternatives, the Total Net Present Worth is lower than the Total Capital Costs."

I mentioned that the costs in the future are "worth" less in present day value. Can you please provide a better explanation of Present Worth, and why some values are higher and others are lower in the summary table? It seems like he wants to know the formula and how it works.

AM

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