



ENGINEERING AND PUBLIC WORKS  
DEPARTMENT

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**Meeting Date:** March 13, 2018  
**To:** Timothy Frenzer, Village Manager  
**From:** Brigitte Berger-Raish, P.E., Director of Engineering and Public Works  
**Subject:** Agenda Item 6.41

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Attached, please find additional agenda material for the stormwater discussion on Tuesday, March 13. At Trustee Dodd's request, Stantec prepared tables which provide summaries of costs and benefits for the stormwater options under consideration. This is essentially the same information that was provided to the Village Board at the February 27 meeting, but in table form instead of in bar charts.

Two tables are provided for each option:

- The first table provides a summary of benefits (structures protected) and costs broken out **by project phase**
- The second table provides a similar summary of benefits (structures protected) and costs broken out **by year** assuming an extended 20-year implementation schedule

Tables for the three basic options (*Sewer Expansion*, *Sewer Expansion plus Neighborhood Storage* and *Neighborhood Storage*) are included in the first 6 pages of this attachment.

The Stantec presentation on 3-13-18 will also introduce two new hybrid variations. The first, *Neighborhood Storage plus Sewer Expansion to deliver 10-year protection*, answers the question "if we choose Option 3 (Neighborhood Storage) how do we get to 10-year protection for the homes that are still vulnerable to flooding?" The cost/benefit tables for this variation are reflected in pages 7 and 8 of this attachment.

The second variation that will be discussed tomorrow night is *Neighborhood Storage plus Full Sewer Expansion*. This hybrid variation layers Option 3 followed by 1. It provides 25-50 year protection and assumes a 30-year implementation schedule. The corresponding tables for this variation can be found on pages 9 and 10 of this attachment.

The two hybrid variations correspond to pages 12-18 in Stantec's 3-13-18 PowerPoint presentation which is included in your Village Board packet.

## Costs and Benefits: Sewer Expansion Option

Phase	Structures Protected by Phase	Cumulative Structures Protected	Cost by Phase	Cumulative Spend
<b>Prelim. Design</b>	0	0	\$ 1,900,000	\$ 1,900,000
1	0	0	\$ 21,800,000	\$ 23,700,000
2	116	116	\$ 22,600,000	\$ 46,300,000
3	104	220	\$ 13,300,000	\$ 59,600,000
4	54	274	\$ 19,700,000	\$ 79,300,000
5	21	295	\$ 15,300,000	\$ 94,600,000
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### Costs and Benefits: Sewer Expansion Option - 20-yr Schedule

Year	Structures Protected by Year	Cumulative Structures Protected	Total Cost by Year	Cumulative Spend	Cumulative Spend w/ Inflation
2018	0	0	\$ 950,000	\$ 950,000	\$ 979,000
2019	0	0	\$ 1,550,000	\$ 2,500,000	\$ 2,623,000
2020	0	0	\$ 12,680,000	\$ 15,180,000	\$ 16,479,000
2021	0	0	\$ 8,520,000	\$ 23,700,000	\$ 26,068,000
2022	0	0	\$ 400,000	\$ 24,100,000	\$ 26,532,000
2023	0	0	\$ 400,000	\$ 24,500,000	\$ 27,009,000
2024	0	0	\$ 12,960,000	\$ 37,460,000	\$ 42,949,000
2025	116	116	\$ 8,840,000	\$ 46,300,000	\$ 54,147,000
2026	0	116	\$ 250,000	\$ 46,550,000	\$ 54,473,000
2027	0	116	\$ 250,000	\$ 46,800,000	\$ 54,809,000
2028	0	116	\$ 7,610,000	\$ 54,410,000	\$ 65,343,000
2029	104	220	\$ 5,190,000	\$ 59,600,000	\$ 72,743,000
2030	0	220	\$ 350,000	\$ 59,950,000	\$ 73,257,000
2031	0	220	\$ 350,000	\$ 60,300,000	\$ 73,786,000
2032	0	220	\$ 11,290,000	\$ 71,590,000	\$ 91,375,000
2033	54	274	\$ 7,710,000	\$ 79,300,000	\$ 103,748,000
2034	0	274	\$ 300,000	\$ 79,600,000	\$ 104,244,000
2035	0	274	\$ 300,000	\$ 79,900,000	\$ 104,754,000
2036	0	274	\$ 8,740,000	\$ 88,640,000	\$ 120,080,000
2037	21	295	\$ 5,960,000	\$ 94,600,000	\$ 130,844,000
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## Costs and Benefits: Hybrid - Neighborhood Storage plus Sewer Expansion

Phase	Structures Protected by Phase	Cumulative Structures Protected	Cost by Phase	Cumulative Spend
<b>Prelim. Design</b>	0	0	\$ 1,600,000	\$ 1,600,000
1	21	21	\$ 18,700,000	\$ 20,300,000
2	0	21	\$ 22,200,000	\$ 42,500,000
3	76	97	\$ 14,900,000	\$ 57,400,000
4	103	200	\$ 9,300,000	\$ 66,700,000
5	52	252	\$ 9,300,000	\$ 76,000,000
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## Hybrid - Neighborhood Storage plus Sewer Expansion - 20-yr Schedule

Year	Structures Protected by Year	Cumulative Structures Protected	Total Cost by Year	Cumulative Spend	Cumulative Spend w/ Inflation
2018	0	0	\$ 800,000	\$ 800,000	\$ 824,000
2019	0	0	\$ 1,325,000	\$ 2,125,000	\$ 2,230,000
2020	0	0	\$ 10,875,000	\$ 13,000,000	\$ 14,113,000
2021	21	21	\$ 7,300,000	\$ 20,300,000	\$ 22,329,000
2022	0	21	\$ 400,000	\$ 20,700,000	\$ 22,793,000
2023	0	21	\$ 400,000	\$ 21,100,000	\$ 23,271,000
2024	0	21	\$ 12,720,000	\$ 33,820,000	\$ 38,915,000
2025	0	21	\$ 8,680,000	\$ 42,500,000	\$ 49,910,000
2026	0	21	\$ 250,000	\$ 42,750,000	\$ 50,236,000
2027	0	21	\$ 250,000	\$ 43,000,000	\$ 50,572,000
2028	0	21	\$ 8,560,000	\$ 51,560,000	\$ 62,421,000
2029	76	97	\$ 5,840,000	\$ 57,400,000	\$ 70,748,000
2030	0	97	\$ 150,000	\$ 57,550,000	\$ 70,968,000
2031	0	97	\$ 150,000	\$ 57,700,000	\$ 71,195,000
2032	0	97	\$ 5,350,000	\$ 63,050,000	\$ 79,530,000
2033	103	200	\$ 3,650,000	\$ 66,700,000	\$ 85,387,000
2034	0	200	\$ 150,000	\$ 66,850,000	\$ 85,635,000
2035	0	200	\$ 150,000	\$ 67,000,000	\$ 85,891,000
2036	0	200	\$ 5,350,000	\$ 72,350,000	\$ 95,272,000
2037	52	252	\$ 3,650,000	\$ 76,000,000	\$ 101,864,000
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## Costs and Benefits: Neighborhood Storage Option

Phase	Structures Protected by Phase	Cumulative Structures Protected	Cost by Phase	Cumulative Spend
<b>Prelim. Design</b>	0	0	\$ 1,200,000	\$ 1,200,000
1	49	49	\$ 14,500,000	\$ 15,700,000
2	77	126	\$ 13,600,000	\$ 29,300,000
3	20	146	\$ 18,700,000	\$ 48,000,000
4	74	220	\$ 5,500,000	\$ 53,500,000
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### Costs and Benefits: Neighborhood Storage Option - 20-yr Schedule

Year	Structures Protected by Year	Cumulative Structures Protected	Total Cost by Year	Cumulative Spend	Cumulative Spend w/ Inflation
2018	0	0	\$ 600,000	\$ 600,000	\$ 618,000
2019	0	0	\$ 600,000	\$ 1,200,000	\$ 1,255,000
2020	0	0	\$ 375,000	\$ 1,575,000	\$ 1,664,000
2021	0	0	\$ 8,445,000	\$ 10,020,000	\$ 11,169,000
2022	49	49	\$ 5,680,000	\$ 15,700,000	\$ 17,754,000
2023	0	49	\$ -	\$ 15,700,000	\$ 17,754,000
2024	0	49	\$ 250,000	\$ 15,950,000	\$ 18,061,000
2025	0	49	\$ 250,000	\$ 16,200,000	\$ 18,378,000
2026	0	49	\$ 7,790,000	\$ 23,990,000	\$ 28,542,000
2027	77	126	\$ 5,310,000	\$ 29,300,000	\$ 35,678,000
2028	0	126	\$ -	\$ 29,300,000	\$ 35,678,000
2029	0	126	\$ 350,000	\$ 29,650,000	\$ 36,177,000
2030	0	126	\$ 350,000	\$ 30,000,000	\$ 36,691,000
2031	0	126	\$ 10,700,000	\$ 40,700,000	\$ 52,876,000
2032	20	146	\$ 7,300,000	\$ 48,000,000	\$ 64,249,000
2033	0	146	\$ -	\$ 48,000,000	\$ 64,249,000
2034	0	146	\$ 100,000	\$ 48,100,000	\$ 64,415,000
2035	0	146	\$ 100,000	\$ 48,200,000	\$ 64,585,000
2036	0	146	\$ 3,150,000	\$ 51,350,000	\$ 70,108,000
2037	74	220	\$ 2,150,000	\$ 53,500,000	\$ 73,992,000
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### Costs and Benefits: Neigh. Storage plus Sewer Exp. (10-yr) - 20-yr Schedule

Phase	Structures Protected by Phase	Cumulative Structures Protected	Cost by Phase	Cumulative Spend
<b>Prelim. Design</b>	0	0	\$ 1,900,000	\$ 1,900,000
1	49	49	\$ 14,500,000	\$ 16,400,000
2	77	126	\$ 13,600,000	\$ 30,000,000
3	20	146	\$ 18,700,000	\$ 48,700,000
4	74	220	\$ 5,500,000	\$ 54,200,000
5	28	248	\$ 20,900,000	\$ 75,100,000
6	27	275	\$ 8,900,000	\$ 84,000,000
7	23	298	\$ 9,000,000	\$ 93,000,000
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**Costs and Benefits: Neigh. Storage plus Sewer Exp. (10-yr) - 20-yr Schedule**

<b>Year</b>	<b>Structures Protected by Year</b>	<b>Cumulative Structures Protected</b>	<b>Total Cost by Year</b>	<b>Cumulative Spend</b>	<b>Cumulative Spend w/ Inflation</b>
2018	0	0	\$ 950,000	\$ 950,000	\$ 979,000
2019	0	0	\$ 950,000	\$ 1,900,000	\$ 1,986,000
2020	0	0	\$ 375,000	\$ 2,275,000	\$ 2,396,000
2021	0	0	\$ 8,445,000	\$ 10,720,000	\$ 11,901,000
2022	49	49	\$ 6,055,000	\$ 16,775,000	\$ 18,920,000
2023	0	49	\$ 7,915,000	\$ 24,690,000	\$ 28,371,000
2024	77	126	\$ 5,835,000	\$ 30,525,000	\$ 35,548,000
2025	0	126	\$ 10,875,000	\$ 41,400,000	\$ 49,324,000
2026	20	146	\$ 7,450,000	\$ 48,850,000	\$ 59,044,000
2027	0	146	\$ 3,200,000	\$ 52,050,000	\$ 63,345,000
2028	74	220	\$ 2,150,000	\$ 54,200,000	\$ 66,321,000
2029	0	220	\$ 600,000	\$ 54,800,000	\$ 67,176,000
2030	0	220	\$ 12,150,000	\$ 66,950,000	\$ 85,019,000
2031	28	248	\$ 8,150,000	\$ 75,100,000	\$ 97,347,000
2032	0	248	\$ 225,000	\$ 75,325,000	\$ 97,697,000
2033	0	248	\$ 5,185,000	\$ 80,510,000	\$ 106,018,000
2034	27	275	\$ 3,490,000	\$ 84,000,000	\$ 111,786,000
2035	0	275	\$ 225,000	\$ 84,225,000	\$ 112,169,000
2036	0	275	\$ 5,245,000	\$ 89,470,000	\$ 121,366,000
2037	23	298	\$ 3,530,000	\$ 93,000,000	\$ 127,742,000
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## Costs and Benefits: Neigh. Storage plus Full Sewer Exp. (25-yr) - 30-yr Schedule

Phase	Structures Protected by Phase	Cumulative Structures Protected	Cost by Phase	Cumulative Spend
<b>Prelim. Design</b>	0	0	\$ 2,600,000	\$ 2,600,000
1	49	49	\$ 14,500,000	\$ 17,100,000
2	77	126	\$ 13,600,000	\$ 30,700,000
3	20	146	\$ 18,700,000	\$ 49,400,000
4	74	220	\$ 7,400,000	\$ 56,800,000
5	0	220	\$ 21,800,000	\$ 78,600,000
6	59	279	\$ 19,400,000	\$ 98,000,000
7	1	280	\$ 9,700,000	\$ 107,700,000
8	30	310	\$ 16,300,000	\$ 124,000,000
9	1	311	\$ 6,800,000	\$ 130,800,000

**Costs and Benefits: Neigh. Storage plus Full Sewer Exp. (25-yr) - 30-yr Schedule**

<b>Year</b>	<b>Structures Protected by Year</b>	<b>Cumulative Structures Protected</b>	<b>Total Cost by Year</b>	<b>Cumulative Spend</b>	<b>Cumulative Spend w/ Inflation</b>
2018	0	0	\$ 2,450,000	\$ 2,450,000	\$ 2,524,000
2019	0	0	\$ 5,650,000	\$ 8,100,000	\$ 8,518,000
2020	49	49	\$ 20,325,000	\$ 28,425,000	\$ 30,727,000
2021	77	126	\$ 22,100,000	\$ 50,525,000	\$ 55,601,000
2022	94	220	\$ 6,275,000	\$ 56,800,000	\$ 62,875,000
2023	0	220	\$ -	\$ 56,800,000	\$ 62,875,000
2024	0	220	\$ 400,000	\$ 57,200,000	\$ 63,367,000
2025	0	220	\$ 400,000	\$ 57,600,000	\$ 63,874,000
2026	0	220	\$ 12,480,000	\$ 70,080,000	\$ 80,158,000
2027	0	220	\$ 8,520,000	\$ 78,600,000	\$ 91,608,000
2028	0	220	\$ -	\$ 78,600,000	\$ 91,608,000
2029	0	220	\$ 350,000	\$ 78,950,000	\$ 92,107,000
2030	0	220	\$ 350,000	\$ 79,300,000	\$ 92,621,000
2031	0	220	\$ 11,110,000	\$ 90,410,000	\$ 109,426,000
2032	59	279	\$ 7,590,000	\$ 98,000,000	\$ 121,251,000
2033	0	279	\$ -	\$ 98,000,000	\$ 121,251,000
2034	0	279	\$ 200,000	\$ 98,200,000	\$ 121,581,000
2035	0	279	\$ 200,000	\$ 98,400,000	\$ 121,922,000
2036	0	279	\$ 5,530,000	\$ 103,930,000	\$ 131,619,000
2037	1	280	\$ 3,770,000	\$ 107,700,000	\$ 138,428,000
2038	0	280	\$ -	\$ 107,700,000	\$ 138,428,000
2039	0	280	\$ 300,000	\$ 108,000,000	\$ 139,003,000
2040	0	280	\$ 300,000	\$ 108,300,000	\$ 139,595,000
2041	0	280	\$ 9,330,000	\$ 117,630,000	\$ 158,561,000
2042	30	310	\$ 6,370,000	\$ 124,000,000	\$ 171,898,000
2043	0	310	\$ -	\$ 124,000,000	\$ 171,898,000
2044	0	310	\$ 100,000	\$ 124,100,000	\$ 172,120,000
2045	0	310	\$ 100,000	\$ 124,200,000	\$ 172,349,000
2046	0	310	\$ 3,920,000	\$ 128,120,000	\$ 181,587,000
2047	1	311	\$ 2,680,000	\$ 130,800,000	\$ 188,092,000