King County

Initial Infiltration and Inflow Reduction Project Alternatives Analysis Report

APPENDIX C.
SELECTED ALTERNATIVE SPREADSHEETS

April 2009

Alternative BLS-E

Basin:	BLS 003
Date:	7/20/2008
Scenario:	BLS003E
Scenario Description:	Rehabilitation of properties downstream of Meter BLS003A; in northeast section of mini-basin

Summary of I/I Removal - Cost Estimates

Description	Quantity	Unit	Unit Cost	Total Cost
Mains - Pipe Burst (easy)	0	LF	$ 134	$ -
Mains - Pipe Burst (difficult)	0	LF	$ 314	$ -
Mains - Pipe Lining (easy)	0	LF	$ -	$ -
Mains - Pipe Lining (difficult)	0	LF	$ -	$ -
Mains - Open Cut Replacement (easy)	0	LF	$ -	$ -
Mains - Open Cut Replacement (difficult)	0	LF	$ -	$ -
Manhole Replacement (easy)	0	EA	$ -	$ -
Manhole Replacement (difficult)	0	EA	$ -	$ -
Lateral Pipe Bursting (easy)	0	EA	$ -	$ -
Lateral Pipe Bursting (medium)	0	EA	$ -	$ -
Lateral Pipe Bursting (difficult)	0	EA	$ -	$ -
Lateral Lining (easy)	0	EA	$ -	$ -
Lateral Lining (medium)	0	EA	$ -	$ -
Lateral Lining (difficult)	0	EA	$ -	$ -
Open Cut Lateral Replacement (easy)	0	EA	$ -	$ -
Open Cut Lateral Replacement (medium)	0	EA	$ -	$ -
Open Cut Lateral Replacement (difficult)	0	EA	$ -	$ -
Side Sewer Pipe Bursting (easy)	0	EA	$ 3,310	$ -
Side Sewer Pipe Bursting (medium)	0	EA	$ 5,380	$ -
Side Sewer Pipe Bursting (difficult)	0	EA	$ 6,600	$ -
Side Sewer Lining (easy)	0	EA	$ -	$ -
Side Sewer Lining (medium)	0	EA	$ -	$ -
Side Sewer Lining (difficult)	0	EA	$ -	$ -
Open Cut Side Sewer Replacement (easy)	0	EA	$ -	$ -
Open Cut Side Sewer Replacement (medium)	0	EA	$ -	$ -
Open Cut Side Sewer Replacement (difficult)	0	EA	$ -	$ -
Lateral/Side Sewer Pipe Bursting (easy)	50	EA	$ 7,295	$ 364,750
Lateral/Side Sewer Pipe Bursting (medium)	13	EA	$ 8,515	$ 110,695
Lateral/Side Sewer Pipe Bursting (difficult)	2	EA	$ 11,220	$ 22,440
Lateral/Side Sewer Lining (easy)	0	EA	$ -	$ -
Lateral/Side Sewer Lining (medium)	0	EA	$ -	$ -
Lateral/Side Sewer Lining (difficult)	0	EA	$ -	$ -
Open Cut Lateral/Side Sewer Replacement (easy)	0	EA	$ -	$ -
Open Cut Lateral/Side Sewer Replacement (medium)	0	EA	$ -	$ -
Open Cut Lateral/Side Sewer Replacement (difficult)	0	EA	$ -	$ -
Direct Disconnects	8	EA	$ 3,000	$ 24,000
			Subtotal	$ 521,885
			Sales Tax 9.0%	$ 46,970
			Construction Subtotal	$ 568,855
			Allied Cost 53.0%	$ 301,493
			Project Cost	$ 870,348
			Contingency 30.0%	$ 261,104
			Total Estimated Project Cost (2007 Dollars)	**$ 1,131,000**

Estimated Construction Cost Including Contingency

Construction Subtotal Incl. Sales Tax	$ 568,855
Contingency 30.0%	$ 170,656
Total Estimated Construction Cost (2007 Dollars)	**$ 739,500**

Summary of I/I Removal - I/I Reduction

Description	Source	Quantity	Units
General			
Projected 20-year I/I	King County	1.68	MGD
Assumed inflow estimate	Estimated	0.061	MGD
Remaining Basin I/I, (I/I minus inflow)		1.62	MGD
Acres	King County	63.36	ac
I/I per acre		25,556	gpad
Number of properties		232	
Total Quantities in Basin			
Total length of mainlines	CCTV Inspection	13,212	LF
Total number of laterals	Assume one lateral per property.	232	
Total number of side sewers	Assume one side sewer per lateral.	232	
Total number of lateral/side sewers	Assume one side sewer per lateral.	232	
Total number of manholes	GIS		
Total number of direct disconnects	Smoke test results	8	
Total Quantities in Basin - Rehabilitated			
Total length of mainlines - rehabilitated		0	LF
Total number of laterals - rehabilitated		0	
Total number of side sewers - rehabilitated		0	
Total number of lateral/side sewers - rehabilitated		65	
Total number of manholes - rehabilitated		0	
Total number of performed disconnections		8	
Percent Rehabilitated in Basin			
Mainlines rehabilitated		0%	
Laterals rehabilitated		0%	
Side sewers rehabilitated		0%	
Lateral/side sewers rehabilitated		28%	
Manholes rehabilitated		0%	
Performed disconnections		100%	
I/I Allocation in Basin (Private Properties)			
Percentage of private properties in basin over which I/I (I/I minus inflow) is to be apportioned	Assumed.	90%	
I/I allocation per property (no degradation)		5	gpm
Number of properties to be rehabilitated		65	
Private property estimated I/I reduction assuming 60% reduction (no degradation)		0.30	MGD
Private property estimated I/I reduction assuming 75% reduction (no degradation)		0.38	MGD
I/I Removal in Basin			
I/I removal due to performed disconnections (100% reduction assumed)		0.06	MGD
I/I removal due to private property rehabilitations (60% I/I reduction assumed per fixed property)		0.30	MGD
I/I removal due to private property rehabilitations (75% reduction assumed per fixed property)		0.38	MGD
Summary: I/I Removal (60% I/I Reduction Assumed for Private Properties; No Degradation)			
Total I/I Removal		0.36	MGD
Minimum Remaining I/I		1.3	MGD
Minimum Remaining I/I		20,783	gpad
Summary: I/I Removal (75% I/I Reduction Assumed for Private Properties; No Degradation)			
Total I/I Removal		0.44	MGD
Minimum Remaining I/I		1.2	MGD
Minimum Remaining I/I		19,589	gpad

Alternative BLS-E

Basin:	BLS 002
Date:	7/20/2008
Scenario:	BLS002E
Scenario Description:	Rehabilitation of easy properties in BLS002 that together with Scenario BLS003E provides a minimum of 1.81 mgd removal at 60% removal efficiency

Summary of I/I Removal - Cost Estimates

Description	Quantity	Unit	Unit Cost	Total Cost
Mains - Pipe Burst (easy)	0	LF	$ 134	$ -
Mains - Pipe Burst (difficult)	0	LF	$ 314	$ -
Mains - Pipe Lining (easy)	0	LF	$ -	$ -
Mains - Pipe Lining (difficult)	0	LF	$ -	$ -
Mains - Open Cut Replacement (easy)	0	LF	$ -	$ -
Mains - Open Cut Replacement (difficult)	0	LF	$ -	$ -
Manhole Replacement (easy)	0	EA	$ -	$ -
Manhole Replacement (difficult)	0	EA	$ -	$ -
Lateral Pipe Bursting (easy)	0	EA	$ -	$ -
Lateral Pipe Bursting (medium)	0	EA	$ -	$ -
Lateral Pipe Bursting (difficult)	0	EA	$ -	$ -
Lateral Lining (easy)	0	EA	$ -	$ -
Lateral Lining (medium)	0	EA	$ -	$ -
Lateral Lining (difficult)	0	EA	$ -	$ -
Open Cut Lateral Replacement (easy)	0	EA	$ -	$ -
Open Cut Lateral Replacement (medium)	0	EA	$ -	$ -
Open Cut Lateral Replacement (difficult)	0	EA	$ -	$ -
Side Sewer Pipe Bursting (easy)	0	EA	$ 3,310	$ -
Side Sewer Pipe Bursting (medium)	0	EA	$ 5,380	$ -
Side Sewer Pipe Bursting (difficult)	0	EA	$ 6,600	$ -
Side Sewer Lining (easy)	0	EA	$ -	$ -
Side Sewer Lining (medium)	0	EA	$ -	$ -
Side Sewer Lining (difficult)	0	EA	$ -	$ -
Open Cut Side Sewer Replacement (easy)	0	EA	$ -	$ -
Open Cut Side Sewer Replacement (medium)	0	EA	$ -	$ -
Open Cut Side Sewer Replacement (difficult)	0	EA	$ -	$ -
Lateral/Side Sewer Pipe Bursting (easy)	270	EA	$ 7,295	$ 1,969,650
Lateral/Side Sewer Pipe Bursting (medium)	0	EA	$ 8,515	$ -
Lateral/Side Sewer Pipe Bursting (difficult)	0	EA	$ 11,220	$ -
Lateral/Side Sewer Lining (easy)	0	EA	$ -	$ -
Lateral/Side Sewer Lining (medium)	0	EA	$ -	$ -
Lateral/Side Sewer Lining (difficult)	0	EA	$ -	$ -
Open Cut Lateral/Side Sewer Replacement (easy)	0	EA	$ -	$ -
Open Cut Lateral/Side Sewer Replacement (medium)	0	EA	$ -	$ -
Open Cut Lateral/Side Sewer Replacement (difficult)	0	EA	$ -	$ -
Direct Disconnects	10	EA	$ 3,000	$ 30,000
			Subtotal	$ 1,999,650
			Sales Tax 9.0%	$ 179,969
			Construction Subtotal	$ 2,179,619
			Allied Cost 53.0%	$ 1,155,198
			Project Cost	$ 3,334,816
			Contingency 30.0%	$ 1,000,445
			Total Estimated Project Cost (2007 Dollars)	**$ 4,335,000**

Estimated Construction Cost Including Contingency

Construction Subtotal Incl. Sales Tax		$ 2,179,619
Contingency	30.0%	$ 653,886
Total Estimated Construction Cost (2007 Dollars)		**$ 2,833,500**

Summary of I/I Removal - I/I Reduction

Description	Source	Quantity	Units
General			
Projected 20-year I/I	King County	3	MGD
Assumed inflow estimate	Estimated	0.112	MGD
Remaining Basin I/I, (I/I minus inflow)		2.89	MGD
Acres	King County	109	ac
I/I per acre		26,494	gpad
Number of properties		386	
Total Quantities in Basin			
Total length of mainlines	CCTV Inspection	0	LF
Total number of laterals	Assume one lateral per property.	386	
Total number of side sewers	Assume one side sewer per lateral.	386	
Total number of lateral/side sewers	Assume one side sewer per lateral.	386	
Total number of manholes	GIS		
Total number of direct disconnects	Smoke test results	10	
Total Quantities in Basin - Rehabilitated			
Total length of mainlines - rehabilitated		0	LF
Total number of laterals - rehabilitated		0	
Total number of side sewers - rehabilitated		0	
Total number of lateral/side sewers - rehabilitated		270	
Total number of manholes - rehabilitated		0	
Total number of performed disconnections		10	
Percent Rehabilitated in Basin			
Mainlines rehabilitated		0%	
Laterals rehabilitated		0%	
Side sewers rehabilitated		0%	
Lateral/side sewers rehabilitated		70%	
Manholes rehabilitated		0%	
Performed disconnections		100%	
I/I Allocation in Basin (Private Properties)			
Percentage of private properties in basin over which I/I (I/I minus inflow) is to be apportioned	Assumed.	90%	
I/I allocation per property (no degradation)		5.8	gpm
Number of properties to be rehabilitated		270	
Private property estimated I/I reduction assuming 60% reduction (no degradation)		1.35	MGD
Private property estimated I/I reduction assuming 75% reduction (no degradation)		1.68	MGD
I/I Removal in Basin			
I/I removal due to performed disconnections (100% reduction assumed)		0.11	MGD
I/I removal due to private property rehabilitations (60% I/I reduction assumed per fixed property)		1.35	MGD
I/I removal due to private property rehabilitations (75% reduction assumed per fixed property)		1.68	MGD
Summary: I/I Removal (60% I/I Reduction Assumed for Private Properties; No Degradation)			
	Total I/I Removal	1.46	MGD
	Minimum Remaining I/I	1.5	MGD
	Minimum Remaining I/I	14,139	gpad
Summary: I/I Removal (75% I/I Reduction Assumed for Private Properties; No Degradation)			
	Total I/I Removal	1.80	MGD
	Minimum Remaining I/I	1.2	MGD
	Minimum Remaining I/I	11,051	gpad

Alternative BLS-F

Basin:	BLS 002
Date:	7/24/2008
Scenario:	BLS002F
Scenario Description:	3.0 mgd Peak I/I in Basin BLS002. Rehabilitation in BLS002 only that gives 1.81 mgd removal at 60% removal efficiency

Summary of I/I Removal - Cost Estimates

Description	Quantity	Unit	Unit Cost	Total Cost
Mains - Pipe Burst (easy)	0	LF	$ 134	$ -
Mains - Pipe Burst (difficult)	0	LF	$ 314	$ -
Mains - Pipe Lining (easy)	0	LF	$ -	$ -
Mains - Pipe Lining (difficult)	0	LF	$ -	$ -
Mains - Open Cut Replacement (easy)	0	LF	$ -	$ -
Mains - Open Cut Replacement (difficult)	0	LF	$ -	$ -
Manhole Replacement (easy)	0	EA	$ -	$ -
Manhole Replacement (difficult)	0	EA	$ -	$ -
Lateral Pipe Bursting (easy)	0	EA	$ -	$ -
Lateral Pipe Bursting (medium)	0	EA	$ -	$ -
Lateral Pipe Bursting (difficult)	0	EA	$ -	$ -
Lateral Lining (easy)	0	EA	$ -	$ -
Lateral Lining (medium)	0	EA	$ -	$ -
Lateral Lining (difficult)	0	EA	$ -	$ -
Open Cut Lateral Replacement (easy)	0	EA	$ -	$ -
Open Cut Lateral Replacement (medium)	0	EA	$ -	$ -
Open Cut Lateral Replacement (difficult)	0	EA	$ -	$ -
Side Sewer Pipe Bursting (easy)	0	EA	$ 3,310	$ -
Side Sewer Pipe Bursting (medium)	0	EA	$ 5,380	$ -
Side Sewer Pipe Bursting (difficult)	0	EA	$ 6,600	$ -
Side Sewer Lining (easy)	0	EA	$ -	$ -
Side Sewer Lining (medium)	0	EA	$ -	$ -
Side Sewer Lining (difficult)	0	EA	$ -	$ -
Open Cut Side Sewer Replacement (easy)	0	EA	$ -	$ -
Open Cut Side Sewer Replacement (medium)	0	EA	$ -	$ -
Open Cut Side Sewer Replacement (difficult)	0	EA	$ -	$ -
Lateral/Side Sewer Pipe Bursting (easy)	292	EA	$ 7,295	$ 2,130,140
Lateral/Side Sewer Pipe Bursting (medium)	51	EA	$ 8,515	$ 434,265
Lateral/Side Sewer Pipe Bursting (difficult)	0	EA	$ 11,220	$ -
Lateral/Side Sewer Lining (easy)	0	EA	$ -	$ -
Lateral/Side Sewer Lining (medium)	0	EA	$ -	$ -
Lateral/Side Sewer Lining (difficult)	0	EA	$ -	$ -
Open Cut Lateral/Side Sewer Replacement (easy)	0	EA	$ -	$ -
Open Cut Lateral/Side Sewer Replacement (medium)	0	EA	$ -	$ -
Open Cut Lateral/Side Sewer Replacement (difficult)	0	EA	$ -	$ -
Direct Disconnects	10	EA	$ 3,000	$ 30,000
			Subtotal	$ 2,594,405
			Sales Tax 9.0%	$ 233,496
			Construction Subtotal	$ 2,827,901
			Allied Cost 53.0%	$ 1,498,788
			Project Cost	$ 4,326,689
			Contingency 30.0%	$ 1,298,007
			Total Estimated Project Cost (2007 Dollars)	**$ 5,625,000**

Estimated Construction Cost Including Contingency

Construction Subtotal Incl. Sales Tax	$ 2,827,901
Contingency 30.0%	$ 848,370
Total Estimated Construction Cost (2007 Dollars)	**$ 3,676,300**

Summary of I/I Removal - I/I Reduction

Description	Source	Quantity	Units
General			
Projected 20-year I/I	King County	3	MGD
Assumed inflow estimate	Estimated	0.112	MGD
Remaining Basin I/I, (I/I minus inflow)		2.89	MGD
Acres	King County	109	ac
I/I per acre		26,494	gpad
Number of properties		386	
Total Quantities in Basin			
Total length of mainlines	CCTV Inspection	0	LF
Total number of laterals	Assume one lateral per property.	386	
Total number of side sewers	Assume one side sewer per lateral.	386	
Total number of lateral/side sewers	Assume one side sewer per lateral.	386	
Total number of manholes	GIS		
Total number of direct disconnects	Smoke test results	10	
Total Quantities in Basin - Rehabilitated			
Total length of mainlines - rehabilitated		0	LF
Total number of laterals - rehabilitated		0	
Total number of side sewers - rehabilitated		0	
Total number of lateral/side sewers - rehabilitated		343	
Total number of manholes - rehabilitated		0	
Total number of performed disconnections		10	
Percent Rehabilitated in Basin			
Mainlines rehabilitated		0%	
Laterals rehabilitated		0%	
Side sewers rehabilitated		0%	
Lateral/side sewers rehabilitated		89%	
Manholes rehabilitated		0%	
Performed disconnections		100%	
I/I Allocation in Basin (Private Properties)			
Percentage of private properties in basin over which I/I (I/I minus inflow) is to be apportioned	Assumed.	90%	
I/I allocation per property (no degradation)		5.8	gpm
Number of properties to be rehabilitated		343	
Private property estimated I/I reduction assuming 60% reduction (no degradation)		1.71	MGD
Private property estimated I/I reduction assuming 75% reduction (no degradation)		2.14	MGD
I/I Removal in Basin			
I/I removal due to performed disconnections (100% reduction assumed)		0.11	MGD
I/I removal due to private property rehabilitations (60% I/I reduction assumed per fixed property)		1.71	MGD
I/I removal due to private property rehabilitations (75% reduction assumed per fixed property)		2.14	MGD
Summary: I/I Removal (60% I/I Reduction Assumed for Private Properties; No Degradation)			
	Total I/I Removal	1.82	MGD
	Minimum Remaining I/I	1.2	MGD
	Minimum Remaining I/I	10,799	gpad
Summary: I/I Removal (75% I/I Reduction Assumed for Private Properties; No Degradation)			
	Total I/I Removal	2.25	MGD
	Minimum Remaining I/I	0.7	MGD
	Minimum Remaining I/I	6,875	gpad

Alternative BEL/ISS-B

Basin:	BEL 031
Date:	6/22/2008
Scenario:	BEL 031-E
Scenario Description:	95% of Easy & Medium Lateral & Side Sewer, excl PVC pipe

Summary of I/I Removal - Cost Estimates

Description	Quantity	Unit	Unit Cost	Total Cost
Mains - Pipe Burst (easy)	0	LF	$ -	$ -
Mains - Pipe Burst (difficult)	0	LF	$ -	$ -
Mains - Pipe Lining (easy)	0	LF	$ -	$ -
Mains - Pipe Lining (difficult)	0	LF	$ -	$ -
Mains - Open Cut Replacement (easy)	0	LF	$ -	$ -
Mains - Open Cut Replacement (difficult)	0	LF	$ -	$ -
Manhole Replacement (easy)	0	EA	$ -	$ -
Manhole Replacement (difficult)	0	EA	$ -	$ -
Lateral Pipe Bursting (easy)	0	EA	$ -	$ -
Lateral Pipe Bursting (medium)	0	EA	$ -	$ -
Lateral Pipe Bursting (difficult)	0	EA	$ -	$ -
Lateral Lining (easy)	0	EA	$ -	$ -
Lateral Lining (medium)	0	EA	$ -	$ -
Lateral Lining (difficult)	0	EA	$ -	$ -
Open Cut Lateral Replacement (easy)	0	EA	$ -	$ -
Open Cut Lateral Replacement (medium)	0	EA	$ -	$ -
Open Cut Lateral Replacement (difficult)	0	EA	$ -	$ -
Side Sewer Pipe Bursting (easy)	0	EA	$ 8,052	$ -
Side Sewer Pipe Bursting (medium)	0	EA	$ 9,047	$ -
Side Sewer Pipe Bursting (difficult)	0	EA	$ 16,445	$ -
Side Sewer Lining (easy)	0	EA	$ -	$ -
Side Sewer Lining (medium)	0	EA	$ -	$ -
Side Sewer Lining (difficult)	0	EA	$ -	$ -
Open Cut Side Sewer Replacement (easy)	0	EA	$ -	$ -
Open Cut Side Sewer Replacement (medium)	0	EA	$ -	$ -
Open Cut Side Sewer Replacement (difficult)	0	EA	$ -	$ -
Lateral/Side Sewer Pipe Bursting (easy)	82	EA	$ 9,995	$ 819,590
Lateral/Side Sewer Pipe Bursting (medium)	25	EA	$ 11,995	$ 299,875
Lateral/Side Sewer Pipe Bursting (difficult)	0	EA	$ 16,995	$ -
Lateral/Side Sewer Lining (easy)	0	EA	$ -	$ -
Lateral/Side Sewer Lining (medium)	0	EA	$ -	$ -
Lateral/Side Sewer Lining (difficult)	0	EA	$ -	$ -
Open Cut Lateral/Side Sewer Replacement (easy)	0	EA	$ -	$ -
Open Cut Lateral/Side Sewer Replacement (medium)	0	EA	$ -	$ -
Open Cut Lateral/Side Sewer Replacement (difficult)	0	EA	$ -	$ -
Direct Disconnects	2	EA	$ 3,000	$ 6,000
			Subtotal	$ 1,125,465
			Sales Tax 9.0%	$ 101,292
			Construction Subtotal	$ 1,226,757
			Allied Cost 53.0%	$ 650,181
			Project Cost	$ 1,876,938
			Contingency 30.0%	$ 563,081
			Total Estimated Project Cost (2007 Dollars)	**$ 2,440,000**

Estimated Construction Cost Including Contingency

Construction Subtotal Incl. Sales Tax		$ 1,226,757
Contingency	30.0%	$ 368,027
Total Estimated Construction Cost (2007 Dollars)		**$ 1,594,800**

Summary of I/I Removal - I/I Reduction

Description	Source	Quantity	Units
General			
Projected 20-year I/I	King County	1.31	MGD
Assumed inflow estimate	Estimated	0.063	MGD
Remaining Basin I/I, (I/I minus inflow)		1.25	MGD
Acres	King County	81.7	ac
I/I per acre		15,269	gpad
Number of properties		213	
Total Quantities in Basin			
Total length of mainlines	CCTV Inspection	14,475	LF
Total number of laterals	Assume one lateral per property.	213	
Total number of side sewers	Assume one side sewer per lateral.	213	
Total number of lateral/side sewers	Assume one side sewer per lateral.	213	
Total number of manholes	GIS	94	
Total number of direct disconnects	Smoke test results	2	
Total Quantities in Basin - Rehabilitated			
Total length of mainlines - rehabilitated		0	LF
Total number of laterals - rehabilitated		0	
Total number of side sewers - rehabilitated		0	
Total number of lateral/side sewers - rehabilitated		107	
Total number of manholes - rehabilitated		0	
Total number of performed disconnections		2	
Percent Rehabilitated in Basin			
Mainlines rehabilitated		0%	
Laterals rehabilitated		0%	
Side sewers rehabilitated		0%	
Lateral/side sewers rehabilitated		50%	
Manholes rehabilitated		0%	
Performed disconnections		100%	
I/I Allocation in Basin (Private Properties)			
Percentage of private properties in basin over which I/I (I/I minus inflow) is to be apportioned	Assumed.	90%	
I/I allocation per property (no degradation)		5	gpm
Number of properties to be rehabilitated		107	
Private property estimated I/I reduction assuming 60% reduction (no degradation)		0.42	MGD
Private property estimated I/I reduction assuming 75% reduction (no degradation)		0.52	MGD
I/I Removal in Basin			
I/I removal due to performed disconnections (100% reduction assumed)		0.06	MGD
I/I removal due to private property rehabilitations (60% I/I reduction assumed per fixed property)		0.42	MGD
I/I removal due to private property rehabilitations (75% reduction assumed per fixed property)		0.52	MGD
Summary: I/I Removal (60% I/I Reduction Assumed for Private Properties; No Degradation)			
	Total I/I Removal	0.48	MGD
	Minimum Remaining I/I	0.8	MGD
	Minimum Remaining I/I	10,155	gpad
Summary: I/I Removal (75% I/I Reduction Assumed for Private Properties; No Degradation)			
	Total I/I Removal	0.58	MGD
	Minimum Remaining I/I	0.7	MGD
	Minimum Remaining I/I	8,877	gpad

Alternative BEL/ISS-B

Basin:	ISS 003
Date:	6/20/2008
Scenario:	ISS 003D (2)
Scenario Description:	Rehabilitation of Easy and Medium properties

Summary of I/I Removal - Cost Estimates

Description	Quantity	Unit	Unit Cost	Total Cost
Mains - Pipe Burst (easy)	0	LF	$ -	$ -
Mains - Pipe Burst (difficult)	0	LF	$ -	$ -
Mains - Pipe Lining (easy)	0	LF	$ -	$ -
Mains - Pipe Lining (difficult)	0	LF	$ -	$ -
Mains - Open Cut Replacement (easy)	0	LF	$ -	$ -
Mains - Open Cut Replacement (difficult)	0	LF	$ -	$ -
Manhole Replacement (easy)	0	EA	$ -	$ -
Manhole Replacement (difficult)	0	EA	$ -	$ -
Lateral Pipe Bursting (easy)	0	EA	$ -	$ -
Lateral Pipe Bursting (medium)	0	EA	$ -	$ -
Lateral Pipe Bursting (difficult)	0	EA	$ -	$ -
Lateral Lining (easy)	0	EA	$ -	$ -
Lateral Lining (medium)	0	EA	$ -	$ -
Lateral Lining (difficult)	0	EA	$ -	$ -
Open Cut Lateral Replacement (easy)	0	EA	$ -	$ -
Open Cut Lateral Replacement (medium)	0	EA	$ -	$ -
Open Cut Lateral Replacement (difficult)	0	EA	$ -	$ -
Side Sewer Pipe Bursting (easy)	0	EA	$ 8,052	$ -
Side Sewer Pipe Bursting (medium)	0	EA	$ 9,047	$ -
Side Sewer Pipe Bursting (difficult)	0	EA	$ 16,445	$ -
Side Sewer Lining (easy)	0	EA	$ -	$ -
Side Sewer Lining (medium)	0	EA	$ -	$ -
Side Sewer Lining (difficult)	0	EA	$ -	$ -
Open Cut Side Sewer Replacement (easy)	0	EA	$ -	$ -
Open Cut Side Sewer Replacement (medium)	0	EA	$ -	$ -
Open Cut Side Sewer Replacement (difficult)	0	EA	$ -	$ -
Lateral/Side Sewer Pipe Bursting (easy)	37	EA	$ 9,995	$ 369,815
Lateral/Side Sewer Pipe Bursting (medium)	76	EA	$ 11,995	$ 911,620
Lateral/Side Sewer Pipe Bursting (difficult)	0	EA	$ 16,995	$ -
Lateral/Side Sewer Lining (easy)	0	EA	$ -	$ -
Lateral/Side Sewer Lining (medium)	0	EA	$ -	$ -
Lateral/Side Sewer Lining (difficult)	0	EA	$ -	$ -
Open Cut Lateral/Side Sewer Replacement (easy)	0	EA	$ -	$ -
Open Cut Lateral/Side Sewer Replacement (medium)	0	EA	$ -	$ -
Open Cut Lateral/Side Sewer Replacement (difficult)	0	EA	$ -	$ -
Direct Disconnects	1	EA	$ 3,000	$ 3,000
			Subtotal	$ 1,284,435
			Sales Tax 9.0%	$ 115,599
			Construction Subtotal	$ 1,400,034
			Allied Cost 53.0%	$ 742,018
			Project Cost	$ 2,142,052
			Contingency 30.0%	$ 642,616
			Total Estimated Project Cost (2007 Dollars)	**$ 2,785,000**

Estimated Construction Cost Including Contingency

Construction Subtotal Incl. Sales Tax		$ 1,400,034
Contingency	30.0%	$ 420,010
Total Estimated Construction Cost (2007 Dollars)		**$ 1,820,000**

Summary of I/I Removal - I/I Reduction

Description	Source	Quantity	Units
General			
Projected 20-year I/I	King County	0.65	MGD
Assumed inflow estimate	Estimated	0.013	MGD
Remaining Basin I/I, (I/I minus inflow)		0.64	MGD
Acres	King County	81.4	ac
I/I per acre		7,826	gpad
Number of properties		133	
Total Quantities in Basin			
Total length of mainlines	CCTV Inspection	16,056	LF
Total number of laterals	Assume one lateral per property.	133	
Total number of side sewers	Assume one side sewer per lateral.	133	
Total number of lateral/side sewers	Assume one side sewer per lateral.	133	
Total number of manholes	GIS		
Total number of direct disconnects	Smoke test results	1	
Total Quantities in Basin - Rehabilitated			
Total length of mainlines - rehabilitated		0	LF
Total number of laterals - rehabilitated		0	
Total number of side sewers - rehabilitated		0	
Total number of lateral/side sewers - rehabilitated		113	
Total number of manholes - rehabilitated		0	
Total number of performed disconnections		1	
Percent Rehabilitated in Basin			
Mainlines rehabilitated		0%	
Laterals rehabilitated		0%	
Side sewers rehabilitated		0%	
Lateral/side sewers rehabilitated		85%	
Manholes rehabilitated		0%	
Performed disconnections		100%	
I/I Allocation in Basin (Private Properties)			
Percentage of private properties in basin over which I/I (I/I minus inflow) is to be apportioned	Assumed.	90%	
I/I allocation per property (no degradation)		3.7	gpm
Number of properties to be rehabilitated		113	
Private property estimated I/I reduction assuming 60% reduction (no degradation)		0.36	MGD
Private property estimated I/I reduction assuming 75% reduction (no degradation)		0.45	MGD
I/I Removal in Basin			
I/I removal due to performed disconnections (100% reduction assumed)		0.01	MGD
I/I removal due to private property rehabilitations (60% I/I reduction assumed per fixed property)		0.36	MGD
I/I removal due to private property rehabilitations (75% reduction assumed per fixed property)		0.45	MGD
Summary: I/I Removal (60% I/I Reduction Assumed for Private Properties; No Degradation)			
	Total I/I Removal	0.37	MGD
	Minimum Remaining I/I	0.3	MGD
	Minimum Remaining I/I	3,393	gpad
Summary: I/I Removal (75% I/I Reduction Assumed for Private Properties; No Degradation)			
	Total I/I Removal	0.46	MGD
	Minimum Remaining I/I	0.2	MGD
	Minimum Remaining I/I	2,285	gpad