

TABLE 1
SERVICE AREA POPULATION PROJECTIONS

	<i>Equivalent Population</i>	<i>Per Capita Flow (L/day)</i>	<i>Total Flow (m³/d)</i>
Haliburton	1928	454	875
Hwy 121 Extension	2331	454	1058
Sub-Total	4259		1933
Head Lake			
- Permanent	557	454	252.9
- Seasonal	32	275	8.8
Grass Lake			
- Permanent	385	454	174.8
- Seasonal	214	275	58.9
North Kashagawigamog - North Shore			
- Permanent	416	454	188.9
- Seasonal	426	275	117.1
North Kashagawigamog - South Shore			
- Permanent	196	454	89.0
- Seasonal	304	275	83.6
Sub-Total	2530		974.0
Grand Total	6789		2907

TABLE 2
SUMMARY OF ALTERNATIVES

	<i>Description</i>	<i>Total Capacity (m³/d)</i>	<i>Phosphorous Discharge Level (mg/L)</i>
Alternative 1	Expand Existing Sewage Treatment Plant with Outlet to Drag River	2907	0.2
Alternative 1(a)	Expand Existing Sewage Treatment Plant with Outlet to Drag River	2907	0.1
Alternative 2	Expand Existing Sewage Treatment Plant with Outlet to Grass Lake	2907	0.2
Alternative 3	Construct a New Sewage Treatment Plant to Service Highway 121 Development and a New Plant to Service the North Shore of North Kashagawigamog	2907	0.2
Alternative 4	Construct a New Sewage Treatment Plant to Service Highway 121 Development and Hamlet of Haliburton	2907	0.2
Alternative 5	Expand Existing Sewage Treatment Plant with Outlet to Burnt River	2907	0.2
Alternative 6	Expand Existing Sewage Treatment Plant with Outlet to North Kashagawigamog Lake	2907	0.2
Alternative 7	Expand Existing Sewage Treatment Plant with Wetland Treatment and Outlet to North Kashagawigamog Lake	2907	0.1 to 0.15
Alternative 8	Expand Existing Treatment Plant with Best Available Technology (BAT) and Outlet to Drag River	2907	0.05

TABLE 3
ESTIMATED PLANT EXPANSION COSTS

	<u><i>Construction Costs</i></u>	<u><i>Operating & Maintenance Costs</i></u>
Alternative 1	\$ 4,600,000	\$ 197,000
Alternative 1 (a)	4,800,000	212,000
Alternative 2	4,950,000	194,000
Alternative 3	6,300,000	230,000
Alternative 4	5,900,000	197,000
Alternative 5	7,100,000	220,000
Alternative 6	6,500,000	215,000
Alternative 7	5,700,000	215,000
Alternative 8	5,675,000	200,000

Notes:

- (1) Costs are 1994 dollars.
- (2) Cost estimates include an allowance for engineering and contingencies.

TABLE 4

**DRAG RIVER SYSTEM PHOSPHOROUS LOADINGS (1)
WITH HALIBURTON SEWAGE TREATMENT PLANT EXPANSION
SERVICE AREA - HALIBURTON AND HIGHWAY 121**

Retention of (P)	Description	Head		Grass		N. Kashag		S. Kashag		Canning	
		80%	0%	80%	0%	80%	0%	80%	0%	80%	0%
Objectives (Background +50%) (2)			13.5		12.9		11.2		8.5		8.0
Existing Conditions (3) (Euphotic Zone)			10.0		12.6		12.7		9.5		9.5 (est.)
Do nothing alternative (existing vacant lots developed)		10.5	15.6	11.6	19.4	10.7	21.2	7.7	14.6	7.3	14.4
Do nothing alternative (existing lots not developed)		9.9	12.8	10.8	15.9	10.0	18.1	7.4	12.9	7.0	12.9
Alternative 1	Drag R.	9.9	12.8	12.8	20.7	11.0	20.2	7.9	14.1	7.5	14.0
Alternative 2	Grass	9.9	12.8	12.8	20.7	11.0	20.2	7.9	14.1	7.5	14.0
Alternative 3	Grass/Kashag	9.9	12.8	12.1	19.9	11.0	20.3	7.9	14.2	7.5	14.0
Alternative 4	Kashag	9.9	12.8	10.8	18.7	11.1	20.3	7.9	14.2	7.5	14.0
Alternative 5	Burnt	9.9	12.8	10.8	18.7	9.9	19.1	7.3	13.6	7.0	13.5
Alternative 6	Kashag/pipe	9.9	12.8	10.8	18.7	11.1	20.3	7.9	14.2	7.5	14.0
Alternative 7	Wetland/Kashag	9.9	12.8	10.8	18.7	10.4	19.7	7.6	13.9	7.2	13.8
Alternative 8 (4)	BAT/Drag River	9.9	12.8	11.3	19.2	10.2	19.4	7.5	13.7	7.1	13.6

Notes:

Concentrations in µg/L

(1) Trophic Status Modeling Performed by N. Hutchinson MOEE (Oct. 19, 1992 and Aug. 24, 1993)

(2) Table 8.0 N. Hutchinson's Report, Oct. 19, 1992

(3) Table 5.0 M. Michalski's Report, Feb. 1993

(4) Interpolated Values

TABLE 5

**DRAG RIVER SYSTEM PHOSPHOROUS LOADINGS (1)
WITH HALIBURTON SEWAGE TREATMENT PLANT EXPANSION
SERVICE AREA - GRASS, HEAD AND NORTH SIDE OF NORTH KASHAGAWIGAMOG**

Retention of (P)	Description	Head		Grass		N. Kashag		S. Kashag		Canning	
		80%	0%	80%	0%	80%	0%	80%	0%	80%	0%
Objectives (Background +50%)(2)		13.5		12.9		11.2		8.5		8.0	
Existing Conditions (3) (Euphotic Zone)		12.4		12.6		12.7		9.5		9.5 (est.)	
Do nothing alternative (existing vacant lots developed)		10.5	15.6	11.6	19.4	10.7	21.2	7.7	14.6	7.3	14.4
Do nothing alternative (existing lots not developed)		9.9	12.8	10.8	15.9	10.0	18.1	7.4	12.9	7.0	12.9
Alternative 1	Drag R.	9.5	10.9	11.1 11.2 (5)	12.4 12.4 (5)	9.5 8.9 (5)	12.7 9.6 (5)	7.1 6.8 (5)	10.3 8.7 (5)	6.9 6.6 (5)	10.9 9.7 (5)
Alternative 2	Grass	9.5	10.9	11.1	12.4	9.5	12.7	7.1	10.3	6.9	10.9
Alternative 3	Grass/Kashag	9.5	10.9	10.4	11.7	9.5	12.8	7.1	10.3	6.9	11.0
Alternative 4	Kashag	9.5	10.9	9.1	10.4	9.6	12.8	7.2	10.3	6.9	11.0
Alternative 5	Burnt	9.5	10.9	9.1	10.4	6.3	11.6	5.5	9.7	5.5	10.5
Alternative 6	Kashag/pipe	9.5	10.9	10.1	10.4	8.9	12.8	6.8	10.3	6.6	11.0
Alternative 7	Wetland/Kashag	9.5	10.9	9.1	10.4	9.6	12.2	7.2	10.0	6.9	10.7
Alternative 8 (4)	BAT/Drag River	9.5	10.9	9.6 9.7 (5)	10.9 10.9 (5)	7.1 6.5 (5)	11.9 8.8 (5)	5.9 5.6 (5)	9.9 8.3 (5)	5.9 5.6 (5)	10.6 9.4 (5)

Notes:

Concentrations in µg/L

(1) Trophic Status Modeling Performed by N. Hutchinson MOEE (Oct. 19, 1992 and Aug. 24, 1993)

(2) Table 8.0 N. Hutchinson's Report, Oct. 19, 1992

(3) Table 5.0 M. Michalski's Report, Feb. 1993

(4) Interpolated Values

(5) Concentration values reflect south side of North Kashagawigamog serviced.

TABLE 6
ESTIMATED CAPITAL COSTS
STAGE 1 EXPANSION TO 2117 m³/DAY TOTAL CAPACITY

<i>Pumping Station No. 1 Modifications</i>	<i>Estimated Costs</i>
Installation of additional pump	\$ 52,500
Refurbishing concrete work	12,500
Refurbishing piping	15,000
 <i>Treatment Plant Expansion</i>	
Mobilization/demobilization	70,000
Excavation and backfill	152,000
Sitework	65,000
Yard Piping and Appurtenances	45,000
Concrete and Reinforcing Steel	735,000
Process Piping	156,000
Chemical feed piping	12,500
Miscellaneous Metals	92,300
Blower, pumping, filter building	84,400
Equipment installed	1,138,000
HVAC	34,300
Electrical	153,000
Controls and instrumentation	78,000
Refurbishing Existing Plant	75,000
Lab Equipment allowance	12,000
Engineering and Contingencies	817,000
 Total Estimated Cost	 \$ 3,800,000

TABLE 7
ESTIMATED OPERATING COSTS
YEAR ONE

<i>Fixed Costs</i>		<i>Estimated Costs</i>	
	Operator w/benefits	\$	58,500
	Heating cost		5,000
	Miscellaneous		6,500
<i>Variable Costs</i>			
	Power Cost		51,800
	Other utilities		600
	Chemicals		16,500
	Sludge Disposal		30,000
	Maintenance & Repairs		32,000
	Miscellaneous		8,600
	Total Estimated Cost	\$	209,500