

INTEGRATED REPORT
GUAM EPA

APPENDIX C

Parameters

Table C1. CMS Physical/Community
Parameters

Physical/Community		STMP (Marine)	STMP (Rivers)	RBMP	GCA	GWSA	FSCMP	MPWQA
PHYSICAL HABITAT <i>in situ</i>								
THALWEG PROFILE								
Thalweg depth						X		
Wetted width						X		
Habitat class						X		
WOODY DEBRIS TALLY								
Large woody debris						X		
CHANNEL & RIPARIAN CROSS-SECTIONS								
Slope and bearing						X		
Substrate size						X		
Bank angle						X		
Bank incision						X		
Bank undercut						X		
Bankful width						X		
Bankful height						X		
Canopy cover						X		
Riparian vegetation structure						X		
Fish cover, algae, macrophytes						X		
Human influence						X		
STREAM DISCHARGE								
Discharge m/s or L/min						X		
BENTHOS & FISH								
Benthic community								
Infunal composition					X			X
Infunal abundance					X			X
Fish Community								
Composition					X	X		X
Abundance					X	X		X
Biomass estimate (Length)					X	X		X
Frequency of external anomalies						X		
Periphyton								
Periphyton: Species	X					X		
Periphyton: Biomass: Ash-Free Dry Mass	X					X		

Table C1. CMS Physical/Community Parameters

Physical/Community		STMP (Marine)	STMP (Rivers)	RBMP	GCA	GWSA	FSCMP	MPWQA
Periphyton (continued)								
	Periphyton: Chlorophyll-a and Pheophytin	X				X		
	Periphyton: Alkaline/Acid Phosphatase					X		
Plankton								
	Plankton: Species	X						
	Plankton: Chlorophyll-a and Pheophytin	X						
	Plankton: Biomass: Ash-Free Dry Mass	X						
Benthic Invertebrates								
	Stream Benthic Integrity Index (BII)					X		
	Biological Condition					X		
BENTHOS & FISH (continued)								
Benthic habitat description								
	Aerial coverage (veg & substrate)	X			X			
	Invertebrate composition & abundance	X			X			
	Degree of wave impact				X			
	Anthropogenic debris				X			
	Threatened/endangered species				X			

Table C2. CMS Water Parameters

WATER		STMP (Marine)	STMP (Rivers)	RBMP	GCA	GWSA	FSCMP	MPWQA
Water Column Characteristics in situ								
Conductivity, <i>field</i> (HACH METER)	X	X				X		
Conductivity, <i>field</i> (YSI or HYDROLAB)					X			X
Current speed and direction, <i>field</i>	X							
Depth assigned, <i>field</i> (YSI/HYDROLAB)	X				X			X
Dissolved Oxygen, <i>in situ</i> (HACH METER)			X		X	X		X
Dissolved Oxygen, <i>in situ</i>	X				X			X
pH, <i>field</i> (HACH METER)	X		X		X			X
pH, <i>field</i> (YSI/HYDROLAB)	X				X			X
Temperature, <i>in situ</i> (HACH METER)			X		X	X		X
Temperature, <i>in situ</i> (YSI/HYDROLAB)					X			X
Temperature, <i>in situ</i> (FIELD)	X				X			X
Salinity (<i>field</i>), <i>in situ</i>	X							
Transparency/clarity (Secchi Visibility), <i>field</i>	X				X			X
Transparency/clarity (PAR), <i>field</i>					X			X
Turbidity (NTU), <i>field</i> (HACH METER)	X		X		X	X		X
Turbidity (NTU), <i>field</i> (YSI/HYDROLAB)	X				X			X
Water Column Parameters								
Acid Neutralizing Capacity-Alkalinity (ANC)						X		
Aluminum, monomeric and organic						X		
Aluminum, total dissolved						X		
Bacteria (<i>E. coli</i>)			X	X	X			
Bacteria (<i>enterococci</i>)	X			X				X
Carbon, dissolved inorganic (DIC), closed						X		
Carbon, dissolved organic (DOC)						X		
Chemical Oxygen Demand			X					
Chlorophyll a and Pheophytin a					X			X
Conductivity, laboratory	X		X		X	X		X
Dissolved Oxygen, laboratory	X		X		X	X		X
Major Anion - Chloride, dissolved						X		
Major Anion - Nitrate, dissolved						X		
Major Anion - Sulfate, dissolved						X		
Major Cation - Calcium dissolved						X		

Table C2. CMS Water
Parameters

WATER		STMP (Marine)	STMP (Rivers)	RBMP	GCA	GWSA	FSCMP	MPWQA
Water Column Parameters (continued)								
Major Cation - Magnesium, dissolved						X		
Major Cation - Potassium, dissolved						X		
Major Cation - Sodium, dissolved						X		
N tot, Total dissolved nitrogen	X	X				X		
NH3, Ammonium					X			X
NH3, Ammonium (Wet Deposition)						X		
NO2, Nitrite	X	X			X			X
NO3, Nitrate nitrogen	X	X			X			X
P -PO4, Orthophosphorus	X	X			X			X
P tot, Total dissolved phosphorus	X	X				X		
pH, closed system						X		
pH, Electrometric Method	X	X			X			X
Silica, dissolved in Fresh water						X		
Total Filterable Solids/Dissolved Solids	X	X						
Total Nonfilterable/Total Suspended Solids	X	X			X	X		X
True Color						X		
Trace Metals:								
Arsenic	X	X						
Cadmium	X	X						
Chromium III		X						
Chromium IV	X	X						
Copper	X	X						
Lead	X	X						
Mercury	X	X						

Table C3. CMS Tissue
Parameters

TISSUE	STMP (Marine)	STMP (Rivers)	RBMP	GCA	GWSA	FSCMP
Polynuclear Aromatic hydrocarbons (PAHs):						
Acenaphthylene				X		X
Acenaphthene				X		X
Anthracene				X		X
Benz(a)anthracene				X		X
Benzo(a)pyrene + (e) for FSCMP only				X		X
Benzo(b)fluoranthene				X		X
Biphenyl				X		
Benzo(k)fluoranthene + (e) for FSCMP only				X		X
Benzo(g,h,i)perylene				X		X
Chrysene				X		X
Dibenz(a,h)anthracene				X		X
Dibenzothiophene				X		
Fluoranthene				X		X
Fluorene				X		X
2,6-dimethylnaphthalene				X		
Indeno(1,2,3-c,d)pyrene				X		X
Naphthalene				X		
Pyrene				X		X
1-methylnaphthalene				X		
1-methylphenanthrene				X		
2-methylnaphthalene				X		
2,3,5-trimethylnaphthalene				X		
2,6-dimethylnaphthalene				X		
PCB Congeners:						
8 - 2,4'-dichlorobiphenyl	X			X	X	X
18 - 2,2',5-trichlorobiphenyl	X			X	X	X
28 - 2,4,4'-trichlorobiphenyl	X			X	X	X
44 - 2,2',3,5'-tetrachlorobiphenyl	X			X	X	X
52 - 2,2',5,5'-tetrachlorobiphenyl	X			X	X	X
66 - 2,3',4,4'-tetrachlorobiphenyl	X			X	X	X
101 - 2,2',4,5,5'-pentachlorobiphenyl	X			X	X	X
105 - 2,3,3',4,4'-pentachlorobiphenyl	X			X	X	X
110/77 - 2,3,3',4',6-pentachlorobiphenyl	X			X		
#77 3,3',4,4'-tetrachlorobiphenyl	X			X	X	X
118 - 2,3',4,4',5-pentachlorobiphenyl	X			X	X	X
126 - 3,3',4,4',5-pentachlorobiphenyl	X			X	X	X
128 - 2,2',3,3',4,4'-hexachlorobiphenyl	X			X	X	X
138 - 2,2',3,4,4',5'-hexachlorobiphenyl	X			X	X	X
153 - 2,2',4,4',5,5'-hexachlorobiphenyl	X			X	X	X
#169 - 3,3',4,4',5,5' Hexachlorobiphenyl					X	X
170 - 2,2',3,3',4,4',5-heptachlorobiphenyl	X			X	X	X
180 - 2,2',3,4,4',5,5'-heptachlorobiphenyl	X			X	X	X
187 - 2,2',3,4',5,5',6-heptachlorobiphenyl	X			X	X	X
195 - 2,2',3,3',4,4',5,6-octachlorobiphenyl	X			X	X	
206 - 2,2',3,3',4,4',5,5',6-nonachlorobiphenyl	X			X	X	
209 - 2,2',3,3',4,4',5,5',6,6'-decachlorobiphenyl	X			X	X	

Table C3. CMS Tissue Parameters

TISSUE	STMP (Marine)	STMP (Rivers)	RBMP	GCA	GWSA	FSCMP
oxins/furans						X
Chlorinated Pesticides other than DDT:						
Aldrin (309-00-2)				X	X	
Carbaryl (Sevin) (63-25-2)	X					
chlorodane, Alpha-				X		
Chlordane-cis (5103-71-9)					X	X
Chlordane-trans (5103-74-2)					X	X
Chlorpyrifos (Dursban Pro/insecticide)					X	X
Diazinon	X				X	X
Dicofol						X
Dieldrin (60-57-1)				X	X	X
Disulfoton					X	X
Endosulfan total						X
Endosulfan I (959-98-8)				X	X	X
Endosulfan II (33213-65-9)				X	X	X
Endosulfan sulfate (1031-07-8)				X		
Endrin (72-20-8)	X			X	X	X
2,4-D (Esteron 99)	X					
Ethion					X	X
Heptachlor (76-44-8)				X	X	
Heptachlor epoxide (1024-57-3)				X	X	X
Hexachlorobenzene (118-74-1)				X	X	X
Hexachlorocyclohexane (58-89-9)	X			X	X	X
Malathion	X					
Methoxychlor	X					
Mirex (2385-85-5)				X	X	X
Naled (Dibrom)	X					
Trans-Nonachlor (3765-80-5)				X	X	X
cis-Nonachlor (5103-73-1)					X	X
Oxychlordane (27304-13-8)					X	X
Oxyfluorfen						X
2,4,5-TP Silvex	X					
Terbufos					X	X
Toxaphene	X			X		X
DDT^o and Metabolites:						
2,4' -DDD (53-19-0)				X	X	X
4,4' -DDD (72-54-8)				X	X	X
2,4' -DDE (3424-82-6)				X	X	X
4,4' -DDE (72-55-9)				X	X	X
2,4' -DDT (789-02-6)				X	X	X
4,4' -DDT (50-29-3)				X	X	X
Inorganics						
Aluminum CAS No. (7429-90-5)				X	X	
Arsenic (7440-38-2) inorganic	X			X	X	X
Cadmium (7440-43-9)	X			X	X	X
Chromium (7440-47-3)	X			X	X	
Copper (7440-50-8)	X			X	X	

Table C3. CMS Tissue
Parameters

TISSUE		STMP (Marine)	STMP (Rivers)	RBMP	GCA	GWSA	FSCMP
Inorganics (continued)							
Iron (7439-89-6)					X	X	
Lead (7439-92-1)	X				X	X	
Mercury-methy (7439-97-6)	X				X	X	X
Nickel (7440-02-0)	X				X	X	
Selenium (7782-49-2)	X				X	X	X
Silver (7440-22-4)	X				X	X	
Tin (7440-31-5)					X	X	
Tributyltin						X	X
Zinc (7440-66-6)					X	X	
Tissue Chemistry							
Percent Lipid Determination	X				X	X	X

Table C4. CMS Sediment
Parameters

SEDIMENT		STMP (Marine)	STMP (Rivers)	RBMP	GCA	GWSA	FSCMP
Sediment: Physical Characteristics							
	Total organic carbon				X		
	Granulometry				X		
Sediment toxicity							
	Amphipod Bioassay				X		
Sediment: contaminant analyses							
Polynuclear Aromatic hydrocarbons (PAHs):							
	Acenaphthylene				X		
	Acenaphthene				X		
	Anthracene				X		
	Benz(a)anthracene				X		
	Benzo(a)pyrene				X		
	Benzo(b)fluoranthene				X		
	Biphenyl				X		
	Benzo(k)fluoranthene				X		
	Benzo(g,h,i)perylene				X		
	Chrysene				X		
	Dibenz(a,h)anthracene				X		
	Dibenzothiophene				X		
	Fluoranthene				X		
	Fluorene				X		
	2,6-dimethylnaphthalene				X		
	Indeno(1,2,3-c,d)pyrene				X		
	Naphthalene				X		
	Pyrene				X		
	1-methylnaphthalene				X		
	1-methylphenanthrene				X		
	2-methylnaphthalene				X		
	2,3,5-trimethylnaphthalene				X		
	2,6-dimethylnaphthalene				X		
PCB Congeners							
	8 - 2,4'-dichlorobiphenyl				X		
	18 - 2,2',5'-trichlorobiphenyl				X		
	28 - 2,4,4'-trichlorobiphenyl				X		
	44 - 2,2',3,5'-tetrachlorobiphenyl				X		
	52 - 2,2',5,5'-tetrachlorobiphenyl				X		
	66 - 2,3',4,4'-tetrachlorobiphenyl				X		
	101 - 2,2',4,5,5'-pentachlorobiphenyl				X		
	105 - 2,3,3',4,4'-pentachlorobiphenyl				X		
	110/77 - 2,3,3',4',6-pentachlorobiphenyl				X		
	3,3',4,4'-tetrachlorobiphenyl				X		
	118 - 2,3',4,4',5-pentachlorobiphenyl				X		
	126 - 3,3',4,4',5-pentachlorobiphenyl				X		
	128 - 2,2',3,3',4,4'-hexachlorobiphenyl				X		
	138 - 2,2',3,4,4',5'-hexachlorobiphenyl				X		
	153 - 2,2',4,4',5,5'-hexachlorobiphenyl				X		
	170 - 2,2',3,3',4,4',5-heptachlorobiphenyl				X		
	180 - 2,2',3,4,4',5,5'-heptachlorobiphenyl				X		
	187 - 2,2',3,4',5,5',6-heptachlorobiphenyl				X		
	195 - 2,2',3,3',4,4',5,6-octachlorobiphenyl				X		
	206 - 2,2',3,3',4,4',5,5',6-nonachlorobiphenyl				X		
	209 - 2,2',3,3',4,4',5,5',6,6'-				X		

Table C4. CMS Sediment
Parameters

SEDIMENT	STMP (Marine)	STMP (Rivers)	RBMP	GCA	GWSA	FSCMP
Chlorinated pesticides other than DDT						
Aldrin				X		
Alpha-chlorodane				X		
Dieldrin				X		
Endosulfan I				X		
Endosulfan II				X		
Endosulfan sulfate				X		
Endrin				X		
Heptachlor				X		
Heptachlor epoxide (breakdown of				X		
Hexachlorobenzene				X		
Lindane (gamma-BHC)				X		
Mirex				X		
Toxaphene				X		
Trans-Nonachlor				X		
DDT and Metabolites						
2,4' -DDD				X		
4,4' -DDD				X		
2,4' -DDE				X		
4,4' -DDE				X		
2,4' -DDT				X		
4,4' -DDT				X		
Inorganics						
Aluminum				X		
Antimony				X		
Arsenic				X		
Cadmium				X		
Chromium				X		
Copper				X		
Iron				X		
Lead				X		
Manganese				X		
Mercury				X		
Nickel				X		
Selenium				X		
Silver				X		
Tin				X		
Zinc				X		

Table C5. Analytical Parameters

Parameters	Method number
pH	EPA 150.1
Total Non-filterable Solids	EPA 160.1
Total Filterable Solids	EPA 160.2
Temperature	EPA 170.1
Turbidity	EPA 180.1
*Seleinum	EPA 200.9
*Arsenic	EPA 206.3
*Barium	EPA 208.1
*Cadmium	EPA 213.2
Calcium	EPA 215.1
*Chromium	EPA 218.2
Cobalt	EPA 219.2
*Copper	EPA 220.2
*Lead	EPA 239.2
Mercury	EPA 245.1
Nickel	EPA 249.2
Silver	EPA 272.2
Sodium	EPA 273.1
Chloride	EPA 325.3
Nitrate-nitrogen	EPA 352.1
Dissolved Oxygen	EPA 360.2
Biochemical Oxygen Demand	EPA 405.1
Chemical Oxygen Demand	EPA 410.1
*Endrin	EPA 505
*Lindane	EPA 505
*Methoxychlor	EPA 505
*Toxaphene	EPA 505
PCB's	EPA 505
***2,4-D (Esteron 99)	EPA 515.1
***2,4,5-TP Silvex	EPA 515.1
VOC's	EPA 524.2
Carbaryl (Sevin)	EPA 531.1
Glyphosate	EPA 547
**Diazinon	EPA 8140
**Malathion	EPA 8140
**Naled (Dibrom)	EPA 8140
Chlorophyll A	SM 10200-H
Salinity (ppt)	SM 2520A
Nitrite-nitrogen	SM 4500-NO2
Total Phosphorus	SM 4500-P
Conductivity	SM 9050
Fecal coliform	SM 9131
Enterococci coliform	SM 9230

Note: * (asterisks) - Denotes Drinking Water Parameter

 ** Methods are not set up for Extraction