

◦Results of Radioactive Material Monitoring of Aquatic Organisms (Locations A and B along the Abukuma River)

< Locations A and B along the Abukuma River: Samples collected >

Locations	General items			Radioactive materials		
	Water	Sediment	Water (Cs)	Water (Sr)	Sediment (Cs)	Sediment (Sr)
A-1	○	○	○	○	○	○
A-2	○	○	○	○	○	○
B-1	○	○	○	○	○	○
B-2	○	○	○	○	○	○
B-3	○	○	○	○	○	○

< Locations A and B along the Abukuma River: Site measurement item >

Locations	Latitude and longitude of the location		Survey date and time		Water			Sediment			Other				
	Scheduled latitude	Scheduled longitude	Date	Time (water)	Time (sediment)	Water temperature (degrees C)	Sediment temperature	Property	Color	Contaminants	Water depth (m)	Transparency (cm)			
A-1 (Surface layer)	37.6210°	140.5218°	2015/6/18	8:48	9:10	21.5	20.9	Sediment with sand	2.5Y3/1	Leaves/plant	8	47 (0.8m)*			
A-1 (Deep layer)				8:38		21.1									
A-2				10:52	10:45	18.6	18.5					None	0.75	>50	
B-1				14:43	14:55	22.2	22.2					Sand	2.5Y4/3	0.2	48
B-2				13:51	13:42	20.9	21.0					Fine sand	2.5Y5/2	0.28	47
B-3				12:52	12:38	17.3	17.4					Sand	2.5Y4/2	0.22	>50

* The numbers in () indicates the degree of transparency.

< Locations A and B along the Abukuma River: General survey items/Analysis of radioactive materials Water >

Locations	Latitude and longitude of the location		Survey date and time		pH	BOD (mg/L)	COD (mg/L)	DO (mg/L)	Electrical conductivity	Salinity	TOC (mg/L)	SS (mg/L)	Turbidity (FNU)	Cs-134 (Bq/L)	Cs-137 (Bq/L)	Sr-90 (Bq/L)
	Scheduled latitude	Scheduled longitude	Date	Time (water)												
A-1 (Surface layer)	37.6210°	140.5218°	2015/6/18	8:48	7.4	1.7	6.5	8.7	16.9	0.09	3.2	18	7.4	0.036	0.13	0.0015
A-1 (Deep layer)				8:38	7.4	1.7	6.5	8.8	17	0.09	3.3	20	9.8	0.024	0.087	—
A-2				10:52	7.3	0.7	4.5	9.5	13	0.07	1.7	7	3.1	0.019	0.064	—
B-1				14:43	7.4	1.3	6.1	8.8	16.9	0.09	3.1	14	8.8	0.038	0.13	—
B-2				13:51	7.4	2	6.1	8.9	15.7	0.08	2.5	13	7.5	0.035	0.13	—
B-3				12:52	7.4	0.7	2.7	10	8.6	0.05	1	6	2.3	0.0061	0.022	—

< Locations A and B along the Abukuma River: General survey items/Analysis of radioactive materials Sediment >

Locations	Latitude and longitude of the location		Survey date and time		pH	Redox potential ENH.E (mV)	Water content (%)	IL (%)	TOC (mg/g-dry)	Soil particle density (g/cm3)	Grain size distribution								Cs-134 (Bq/kg-dry)	Cs-137 (Bq/kg-dry)	Sr-90 (Bq/kg-dry)
	Scheduled latitude	Scheduled longitude	Date	Time (sediment)							Gravel (2-75mm) (%)	Coarse sand (0.85-2mm) (%)	Medium sand (0.25-0.85mm) (%)	Fine sand (0.075-0.25mm) (%)	Silt (0.005-0.0075mm) (%)	Clay (Less than 0.005mm) (%)	Median grain diameter	Maximum grain diameter			
A-1	37.6210°	140.5218°	2015/6/18	9:10	7.1	162	39.1	3.7	4.5	2.68	0	0.1	38.8	32.9	14.2	14	0.21	2	120	590	N.D. (0.12)
A-2				10:45	6.9	367	18.9	1.7	4.1	2.759	20.7	44	27.2	5.8	1.1	1.2	1.1	19	50	190	—
B-1				14:55	7.3	309	12.8	0.8	1.3	2.697	29.5	49.6	16.3	4.2	0.3	0.1	1.5	9.5	13	53	—
B-2				13:42	7.1	357	26.5	1.6	2.4	2.771	3.8	2.6	60.1	30.1	1.5	1.9	0.31	9.5	53	180	—
B-3				12:38	6.9	385	15.4	1.1	2.1	2.649	32.1	36.8	23	6.8	0.7	0.6	1.4	4.75	20	74	—

< Locations A and B along the Abukuma River: Survey items Aquatic organisms >

Location	Sampling point	Latitude and longitude of the location		Sampling Date	Division	Class	Order	Family	Species name	English name	Population	Sample weight (kg-wet)	Growth stage	Note		Radioactive cesium (Bq/kg-wet)		Sr-90 (Bq/kg-wet)						
		Latitude	Longitude											Stomach contents	Measurement site	Cs-134	Cs-137							
A-2	Harase River	37.5673°	140.3946°	2015/6/17	Phytoplankton	—	—	—	—	Riverbed Deposits (include algae)	—	0.015	—	—	—	57	200	—						
					Arthropod	Insecta	Trichoptera	Stenoprychidae	<i>Stenopryche marmorata</i>	<i>Stenopryche marmorata</i>	81	0.036	Larva	—	—	—	8.3	32	—					
					Arthropod	Insecta	Odonata	Gomphidae	<i>Siebekius albardae</i>	<i>Siebekius albardae</i>	24	0.016	Larva (dragonfly larva)	—	—	—	5.8	14	—					
					Arthropod	Insecta	Odonata	Cordulegastriidae	<i>Anotogaster sieboldii</i>	<i>Anotogaster sieboldii</i>	—	—	—	—	—	—	—	—	—	—				
					Arthropod	Insecta	Odonata	Gomphidae	<i>Stylogomphus suzuki</i>	<i>Stylogomphus suzuki</i>	34	0.027	Larva (dragonfly larva)	—	—	—	—	—	—					
					Arthropod	Insecta	Odonata	Gomphidae	<i>Meligomphus viridicostus</i>	<i>Meligomphus viridicostus</i>	—	—	—	—	—	—	—	—	—					
					Arthropod	Insecta	Odonata	Gomphidae	<i>Asiogomphus melanops</i>	<i>Asiogomphus melanops</i>	—	—	—	—	—	—	—	—	—					
					Arthropod	Malacostraca	Decapoda	Procambarus	<i>Procambarus clarkii</i>	Red swamp crayfish	4	0.027	Larva, Imago	—	—	—	—	4.4	17	—				
					Arthropod	Malacostraca	Decapoda	Aysidae	<i>Necardianus sp.</i>	<i>Necardianus sp.</i>	1420	0.16	Imago	—	—	—	—	3.4	13	—				
					Mollusca	Gastropoda	Subgastropoda	Physicseridae	<i>Semislucospora libertina</i>	<i>Semislucospora libertina</i>	51	0.026	Imago	—	—	—	—	6.3	20	—				
					Vertebrata	Osteichthyes	Cypriniformes	Cobitidae	<i>Nemacheilus toni</i>	Stone loach	2	0.015	Mature fish	—	—	—	—	Molluscan body	—	—	—			
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Misgurnus anguillicaudatus</i>	Oriental weatherfish	18	0.046	Mature fish	—	—	—	—	N.D. (2.5)	5.2	—				
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Candacia temnickii</i>	Dark chub	5	0.035	Mature fish	—	—	—	—	2.8	12	—				
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Phoxinus lagoskii steindachneri</i>	Amar Minnow	5	0.017	Mature fish	—	—	—	—	3.3	8.7	—				
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Oncorhynchus masou masou</i>	Yamame trout	42	0.33	Immature fish (0-year-old)	—	—	—	—	N.D. (2.8)	5.3	—				
					Vertebrata	Amphibia	Anura	Ranidae	<i>Glandirana rugosa</i>	Winkled Frog	5	0.049	Imago	—	—	—	—	2.1	7.8	—				
					Vertebrata	Amphibia	Anura	Ranidae	<i>Pelodytes porosus porosus</i>	European pond frog	—	—	—	—	—	—	—	—	4.9	17	—			
					Vertebrata	Amphibia	Anura	—	—	Tadpole	30	0.033	Larva (tadpoles)	—	—	—	—	—	32	120	—			
					Vertebrata	Amphibia	Caudata	Salmundridae	<i>Cynops pyrrhogaster</i>	<i>Cynops pyrrhogaster</i>	4	0.018	Imago	—	—	—	—	—	N.D. (3.2)	8.8	—			
					Particulate Organic Matter	—	—	—	—	Bottom fallen leaves	—	0.22	—	—	—	—	—	—	92	350	—			
					B-2	The main stream of the Abukuma River	37.8121°	140.5058°	2015/6/24	Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Hemibarbus barbus</i>	Hemibarbus barbus	1	1.3	Mature fish (6-year-old)	Obscure digesta	—	—	4.1	15	—
										Vertebrata	Osteichthyes	Osmernidae	Osmernidae	<i>Plecoglossus altivelis altivelis</i>	Sweetfish	102	2.0	Mature fish	—	—	—	13	53	0.13
										Vertebrata	Osteichthyes	Perciformes	Centrarchidae	<i>Micropterus dolomieu dolomieu</i>	Small mouth bass	1	0.37	Mature fish (2-year-old)	Empty stomach	—	—	—	7.5	26
Vertebrata	Osteichthyes	Siluriformes	Siluridae	<i>Silurus asotus</i>						Amar catfish	1	1.4	Mature fish (19-year-old)	Empty stomach	—	—	—	14	46	0.39				

< Locations A and B along the Abukuma River: Survey items Aquatic organisms >

Location	Sampling point	Latitude and longitude of the location		Sampling Date	Division	Class	Order	Family	Species name	English name	Population	Sample weight (kg-wet)	Note			Radioactive cesium (Bq/kg-wet)		Sr-90 (Bq/kg-wet)				
		Latitude	Longitude										Growth stage	Stomach contents	Measurement site	Cs-134	Cs-137					
B-3	Surikami River	37.8182°	140.4679°	2015/6/18	Phycophyta	—	—	—	—	Riverbed Deposits (include algae)	-	0.013	—	—	—	27	98	-				
					Monocots	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
					Arthropod	Insecta	Trichoptera	Potamogetonaceae	<i>Potamogeton crispus</i>	Curly-leaf pondweed	-	0.27	—	—	—	—	—	—	1.8	6.7	-	
					Arthropod	Insecta	Trichoptera	Stenoprychidae	<i>Stenopryche marmorata</i>	Stenopryche marmorata	311	0.10	Larva	—	—	—	—	—	6.7	2.7	-	
					Arthropod	Insecta	Odonata	Corduleidae	<i>Macromia amphigena amphigena</i>	Macromia amphigena	—	—	—	—	—	—	—	—	—	—	—	—
					Arthropod	Insecta	Odonata	Cordulegastridae	<i>Anotogaster sieboldii</i>	Anotogaster sieboldii	—	—	—	—	—	—	—	—	—	—	—	—
					Arthropod	Insecta	Odonata	Gomphidae	<i>Meligomphus viridicostus</i>	<i>Meligomphus viridicostus</i>	62	0.027	Larva (dragonfly larva)	—	—	—	—	—	N.D. (1.4)	4.6	-	
					Arthropod	Insecta	Odonata	Gomphidae	<i>Sieboldius albardae</i>	Sieboldius albardae	—	—	—	—	—	—	—	—	—	—	—	—
					Arthropod	Insecta	Megaloptera	Corydalidae	<i>Protonerpes grandis</i>	Protonerpes grandis	33	0.017	Larva	—	—	—	—	—	—	10	31	-
					Arthropod	Malacostraca	Decapoda	Piscariidae	<i>Procambarus clarkii</i>	Rice swamp crayfish	7	0.12	Imago	—	—	—	—	—	5.4	20	-	
					Mollusca	Gastropoda	Stroboconcha	Pisuroceridae	<i>Semialcospira libertina</i>	Semialcospira libertina	15	0.0048	Imago	—	—	—	—	—	Molluscan body	18	50	-
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Candacia temminckii</i>	Dark chub	3	0.05	Mature fish (3-year-old)	Terrestrial insects	—	—	—	—	Viscera removed	2.0	7.8	-
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Tribolodon hakonensis</i>	Japanese dace	1	0.0039	Mature fish (1-year-old)	—	—	—	—	—	N.D. (12.0)	N.D. (12.0)	-	
					Vertebrata	Osteichthyes	Cypriniformes	Cobitidae	<i>Misgurnus anguillicaudatus</i>	Oriental weatherfish	24	0.064	Mature fish	—	—	—	—	—	2.1	8.9	-	
					Vertebrata	Osteichthyes	Cypriniformes	Cobitidae	<i>Nemacheilus toni</i>	Stone loach	68	0.025	Mature fish	—	—	—	—	—	2.1	6.1	-	
					Vertebrata	Osteichthyes	Salmoniformes	Salmonidae	<i>Oncorhynchus masou masou</i>	Yanase trout	19	0.29	Mature fish (1-year-old)	—	—	—	—	—	1.9	7.7	-	
					Vertebrata	Amphibia	Anura	Ranidae	<i>Lithobates catesbeianus</i>	American Bullfrog	3	0.037	Larva (tadpoles)	—	—	—	—	—	57	210	-	
					Vertebrata	Amphibia	Anura	Ranidae	<i>Lithobates catesbeianus</i>	American Bullfrog	3	0.031	Larva (tadpoles)	—	—	—	—	—	28	110	-	
										Particulate Organic Matter				Bottom fallen leaves		-	0.24	—	—	6.0	24	-

*1: Organisms were collected in or around the targeted water areas.

*2: When multiple types of aquatic organisms were collected, a sample was prepared by mixing them.

*3: For a sample made of multiple types of aquatic organisms, the name of the dominant one largest in number is underlined.

*4: Basically, measurement was conducted for all organism samples. Viscera (stomach and bowels) were removed for the measurement when possible so that undigested food and sediments, etc. in the digestive system would be excluded.

*5: A statement in red in the "Growth stage" column shows the age assessed based on squama or otolith.

*6: Plankton (suspended algae) is the residue remaining after the filtration of lake water or seawater with a plankton net (40µm-mesh).

*7: River bottom materials (incl. algae) are algae, etc. that were scratched off stones with a brush, etc. and may include very fine particles such as inorganic silt and clay.

*8: N.D. means to be below the detection limit and figures in parentheses show the detection limit.

*9: Activity concentrations include counting errors, but the details are omitted here.