

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

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

Locations	Items	Latitude and longitude of the location		Survey date and time			Water				Sediment		Other				
		Latitude	Longitude	Date	Time (water)	Time (sediment)	Water temperature (degrees C)	Sediment temperature (degrees C)	Property	Color	Contaminants	Water depth (m)	Transparency (cm)				
A-1(Surface layer)		37.6210°	140.5218°	2024/6/25	08:52	09:15	22.9	22.0	Silt with sand	5Y3/2	None	5.10	>50 (1.4m)*				
A-1(Bottom layer)	08:38																
A-2	11:04	11:15	23.1		22.8	Sand								2.5Y4/3	None	0.28	>50
B-2	14:30	14:43	24.6		22.9	Sand								10YR4/3	None	0.53	>50
B-3	13:21	13:30	20.3		20.8	Sand								10YR4/4	None	0.48	>50

* The number in parentheses indicates Secchi disk depth.

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

Locations	Items	Latitude and longitude of the location		Survey date and time		pH	BOD (mg/L)	COD (mg/L)	DO (mg/L)	Electric conductivity (mS/m)	Salinity	TOC (mg/L)	SS (mg/L)	Turbidity (FNU)	Cs-134 (Bq/L)	Cs-137 (Bq/L)	Sr-90 (Bq/L)
		Latitude	Longitude	Date	Time (water)												
A-1(Surface layer)		37.6210°	140.5218°	2024/6/25	08:52	7.3	1.6	5.8	8.2	18.6	0.09	2.7	9	3.7	N.D.(0.0014)	0.018	0.00090
A-1(Bottom layer)	08:38				7.4	1.9	6.2	8.1	18.2	0.09	2.7	11	4.5	N.D.(0.0015)	0.018	-	
A-2	11:04	7.5	1.1		3.8	9.6	13.8	0.07	1.5	6	2.0	N.D.(0.0016)	0.018	-			
B-2	14:30	7.4	1.8		5.3	9.0	19.2	0.09	2.0	18	4.4	N.D.(0.0014)	0.026	-			
B-3	13:21	7.7	0.9		2.6	10.4	8.9	0.05	1.3	2	1.2	N.D.(0.0015)	0.0025	-			

Note) N.D. means to be below the detection limit and figures in parentheses show the detection limit.

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

Locations	Items	Latitude and longitude of the location		Survey date and time		pH	Redox potential E _{NHLE} (mV)	Water content (%)	IL (%)	TOC (mg/g-dry)	Soil particle density (g/cm ³)	Grain size distribution						Cs-134 (Bq/kg-dry)	Cs-137 (Bq/kg-dry)	Sr-90 (Bq/kg-dry)			
		Latitude	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 (0.005-0.075mm) (%)	Clay (Less than 0.005mm) (%)				Median grain diameter (mm)	Maximum grain diameter (mm)	
A-1		37.6210°	140.5218°	2024/6/25	09:15	6.9	138	63.3	10.5	34.0	2.550	0.0	0.0	0.7	21.9	48.0	2.2	29.4	0.020	2.0	6.8	560	0.37
A-2	11:15				7.2	502	27.4	2.3	2.8	2.650	5.4	42.1	47.4	2.9	2.2	4.0	0.82	4.8	1.9	100	-		
B-2	14:43	7.4	504		23.8	2.1	2.1	2.690	0.1	1.7	68.7	23.3	2.2	4.0	0.34	4.8	1.8	110	-				
B-3	13:30	7.3	508		16.6	1.2	1.3	2.610	47.1	45.7	5.7	1.3	0.2	1.9	9.5	0.43	30	-					

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

Locations	Sampling point	Latitude and longitude of the location		Sampling date	Division	Class	Order	Family	Scientific 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	Total	Cs-134	Cs-137			
A-1	The main stream of the Abukuma River	37.6210°	140.5218°	2024/6/20	Algae/plant	-	-	-	-	Riverbed Deposits (Include algae)	-	0.0058	-	-	-	240	N.D.(24)	240	-		
					Arthropoda	Insecta	Odonata	Corduliidae	<i>Macromia amphigena amphigena</i>	<i>Macromia amphigena</i>	32	0.0086	Larva (Dragonfly larva)	-	-	-	-	N.D.	N.D.(4.8)	N.D.(4.1)	-
					Arthropoda	Insecta	Odonata	Cordulegastridae	<i>Anotogaster sieboldii</i>	<i>Anotogaster sieboldii</i>											
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Melligomphus viridicostus</i>	<i>Melligomphus viridicostus</i>											
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Sieboldius albardae</i>	<i>Sieboldius albardae</i>											
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Asiagomphus melaenops</i>	<i>Asiagomphus melaenops</i>											
				Arthropoda	Insecta	Megaloptera	Corydalidae	<i>Protohermes grandis</i>	<i>Protohermes grandis</i>												
				2024/6/21	Arthropoda	Malacostraca	Decapoda	Cambaridae	<i>Procambarus clarkii</i>	Red swamp crawfish	1	0.010	Imago	-	-	-	10	N.D.(4.7)	10	-	
					Arthropoda	Malacostraca	Decapoda	Atyidae	<i>Neocaridina</i> sp.	Neocaridina	624	0.17	Juvenile, Imago	-	-	-	2.2	N.D.(0.36)	2.2	-	
				2024/6/20	Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Tribolodon hakonensis</i>	Japanese dace	11	0.23	Immature fish, Mature fish	Obscure digesta	-	Viscera removed	4.1	N.D.(0.32)	4.1	-	
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Opsarichthys platypus</i>	Pale chub	89	0.83	Immature fish, Mature fish	-	-	-	3.9	N.D.(0.40)	3.9	-	
				2024/6/21	Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Carassius auratus</i>	<i>Carassius auratus langsdorffii</i>	6	5.0	Mature fish	Obscure digesta	-	Viscera removed	2.7	N.D.(0.31)	2.7	0.29	
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Hemibarbus barbus</i>	<i>Hemibarbus barbus</i>	1	0.17	Immature fish	Obscure digesta	-	Viscera removed	3.3	N.D.(0.30)	3.3	-	
				2024/6/20	Vertebrata	Osteichthyes	Cypriniformes	Cobitidae	<i>Misgurnus anguillicaudatus</i>	Oriental weatherfish	5	0.046	Immature fish, Mature fish	-	-	-	3.3	N.D.(0.86)	3.3	-	
Vertebrata	Osteichthyes	Cypriniformes	Cobitidae		<i>Nemacheilus toni</i>	Stone loach	167	0.44	Immature fish	-	-	-	1.2	N.D.(0.26)	1.2	-					
2024/6/21	Vertebrata	Osteichthyes	Perciformes	Centrarchidae	<i>Micropterus dolomieu</i>	Small mouth bass	1	0.86	Mature fish	Red swamp crawfish	-	Viscera removed	7.1	N.D.(1.1)	7.1	-					
	Vertebrata	Osteichthyes	Siluriformes	Ictaluridae	<i>Ictalurus punctatus</i>	Channel catfish	4	5.7	Immature fish, Mature fish	Fish	-	Viscera removed	6.5	N.D.(1.1)	6.5	0.14					
2024/6/20	Coarse Particulate Organic Matter	-	-	-	-	Bottom fallen leaves	-	0.21	-	-	-	-	15	N.D.(1.2)	15	-					
A-2	Harase River	37.5673°	140.3946°	2024/6/20	Algae/plant	-	-	-	-	Riverbed Deposits (Include algae)	-	0.0080	-	-	-	80	N.D.(11)	80	-		
					Arthropoda	Insecta	Odonata	Corduliidae	<i>Macromia amphigena amphigena</i>	<i>Macromia amphigena</i>	95	0.050	Larva (Dragonfly larva)	-	-	-	5.0	N.D.(1.3)	5.0	-	
					Arthropoda	Insecta	Odonata	Cordulegastridae	<i>Anotogaster sieboldii</i>	<i>Anotogaster sieboldii</i>											
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Nihogomphus viridis</i>	<i>Nihogomphus viridis</i>											
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Melligomphus viridicostus</i>	<i>Melligomphus viridicostus</i>											
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Sieboldius albardae</i>	<i>Sieboldius albardae</i>											
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Davidius</i> sp.	<i>Davidius</i>											
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Anisogomphus maaeki</i>	<i>Anisogomphus maaeki</i>											
					Arthropoda	Insecta	Odonata	Libellulidae	<i>Sympetrum</i> sp.	<i>Sympetrum</i>											
					Arthropoda	Insecta	Odonata	Libellulidae	<i>Orthetrum albistylum speciosum</i>	Common skimmer											
					Arthropoda	Insecta	Odonata	Aeshnidae	<i>Boyeria maclachlani</i>	<i>Boyeria maclachlani</i>											
					Arthropoda	Malacostraca	Decapoda	Cambaridae	<i>Procambarus clarkii</i>	Red swamp crawfish											
					Arthropoda	Malacostraca	Decapoda	Atyidae	<i>Neocaridina</i> sp.	Neocaridina											
					Vertebrata	Osteichthyes	Scorpaeniformes	Cottidae	<i>Cottus pollux</i>	Japanese fluvial sculpin											
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Phoxinus lagowskii steindachneri</i>	Amur minnow											
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Tribolodon hakonensis</i>	Japanese dace											
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Opsarichthys platypus</i>	Pale chub											
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Candidia temminckii</i>	Dark chub											
					Vertebrata	Osteichthyes	Cypriniformes	Cobitidae	<i>Misgurnus anguillicaudatus</i>	Oriental weatherfish											
					Vertebrata	Osteichthyes	Cypriniformes	Cobitidae	<i>Nemacheilus toni</i>	Stone loach											
					Vertebrata	Cephalaspidomorph	Petromyzontiformes	Petromyzontidae	<i>Lethenteron reissneri</i>	Far eastern brook lamprey											
					Vertebrata	Amphibia	Anura	-	-	Frog											
					Vertebrata	Amphibia	Anura	Ranidae	<i>Rana japonica</i>	Japanese brown frog											
Vertebrata	Amphibia	Anura	Glandirana	<i>Glandirana rugosa</i>	Wrinkled frog																
Coarse Particulate Organic Matter	-	-	-	-	Bottom fallen leaves	-	0.22	-	-	-	-	38	N.D.(1.4)	38	-						

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

*6: 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.

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Locations	Sampling point	Latitude and longitude of the location		Sampling date	Division	Class	Order	Family	Scientific 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	Total	Cs-134	Cs-137			
B-3	Surikami River	37.8182°	140.4679°	2024/6/21	Algae/plant	-	-	-	-	Riverbed Deposits (Include algae)	-	0.016	-	-	-	32	N.D.(5.2)	32	-		
					Algae/plant	Monocotyledoneae	Najadales	Potamogetonaceae	<i>Potamogeton crispus</i>	Curly-leaf pondweed	-	0.29	-	-	-	2.2	N.D.(0.31)	2.2	-		
					Arthropoda	Insecta	Plecoptera	Perlidae	<i>Paragnetina suzukii</i>	<i>Paragnetina suzukii</i> Okamoto	34	0.020	Larva	-	-	-	N.D.	N.D.(2.3)	N.D.(1.9)	-	
					Arthropoda	Insecta	Trichoptera	Stenopsychidae	<i>Stenopsyche marmorata</i>	<i>Stenopsyche marmorata</i>	231	0.081	Larva	-	-	-	4.1	N.D.(0.74)	4.1	-	
					Arthropoda	Insecta	Odonata	Corduliidae	<i>Macromia amphigena amphigena</i>	<i>Macromia amphigena</i>	169	0.090	Larva (Dragonfly larva)	-	-	-	0.91	N.D.(0.43)	0.91	-	
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Nihogomphus viridis</i>	<i>Nihogomphus viridis</i>				-	-	-	-	-	-	-	-
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Melligomphus viridicostus</i>	<i>Melligomphus viridicostus</i>				-	-	-	-	-	-	-	-
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Sieboldius albardae</i>	<i>Sieboldius albardae</i>				-	-	-	-	-	-	-	-
					Arthropoda	Insecta	Megaloptera	Corydalidae	<i>Protohermes grandis</i>	<i>Protohermes grandis</i>	223	0.22	Larva	-	-	-	0.65	N.D.(0.29)	0.65	-	
					Arthropoda	Malacostraca	Decapoda	Cambaridae	<i>Procambarus clarkii</i>	Red swamp crawfish	6	0.087	Juvenile, Imago	-	-	-	3.9	N.D.(0.47)	3.9	-	
					Vertebrata	Osteichthyes	Anguilliformes	Anguillidae	<i>Anguilla japonica</i>	Japanese eel	1	0.10	Immature fish	<i>Sieboldius albardae</i>	Viscera removed	-	2.6	N.D.(0.48)	2.6	-	
					Vertebrata	Osteichthyes	Scorpaeniformes	Cottidae	<i>Cottus pollux</i>	Japanese fluvial sculpin	64	0.45	Immature fish	-	-	-	2.0	N.D.(0.29)	2.0	-	
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Phoxinus lagowskii steindachneri</i>	Amur minnow	67	0.30	Immature fish, Mature fish	-	-	-	1.6	N.D.(0.28)	1.6	-	
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Tribolodon hakonensis</i>	Japanese dace	3	0.029	Immature fish	-	-	-	2.5	N.D.(1.2)	2.5	-	
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Pseudogobio esocinus esocinus</i>	<i>Pseudogobio esocinus esocinus</i>	2	0.030	Immature fish, Mature fish	-	-	-	2.6	N.D.(1.5)	2.6	-	
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Cyprinus carpio</i>	Common carp	1	1.3	Mature fish	Obscure digesta	Viscera removed	-	2.3	N.D.(0.30)	2.3	0.28	
					Vertebrata	Osteichthyes	Cypriniformes	Cobitidae	<i>Cobitis biwae</i>	<i>Cobitis biwae</i>	12	0.056	Mature fish	-	-	-	3.7	N.D.(0.86)	3.7	-	
					Vertebrata	Osteichthyes	Cypriniformes	Cobitidae	<i>Misgurnus anguillicaudatus</i>	Oriental weatherfish	1	0.022	Mature fish	-	-	-	2.9	N.D.(1.5)	2.9	-	
					Vertebrata	Osteichthyes	Cypriniformes	Cobitidae	<i>Nemacheilus toni</i>	Stone loach	63	0.79	Immature fish	-	-	-	1.8	N.D.(0.23)	1.8	-	
					Vertebrata	Osteichthyes	Salmoniformes	Osmeridae	<i>Plecoglossus altivelis altivelis</i>	Sweetfish	44	0.58	Immature fish, Mature fish	-	-	-	5.8	N.D.(0.69)	5.8	-	
					Vertebrata	Osteichthyes	Salmoniformes	Salmonidae	<i>Oncorhynchus masou</i>	Yamame trout	4	0.052	Immature fish	-	-	-	1.2	N.D.(0.82)	1.2	-	
					Vertebrata	Osteichthyes	Siluriformes	Bagridae	<i>Tachysurus tokiensis</i>	Cut-tailed bullhead	2	0.031	Immature fish, Mature fish	-	-	-	1.9	N.D.(1.5)	1.9	-	
					Vertebrata	Osteichthyes	Siluriformes	Siluridae	<i>Silurus asotus</i>	Amur catfish	1	2.4	Mature fish	Stone loach	Viscera removed	-	7.6	N.D.(1.3)	7.6	0.17	
Vertebrata	Osteichthyes	Siluriformes	Siluridae	<i>Silurus asotus</i>	Amur catfish	1	2.9	Mature fish	Stone loach	Viscera removed	-	7.1	N.D.(1.3)	7.1	0.13						
Vertebrata	Amphibia	Anura	Lithobates	<i>Lithobates catesbeianus</i>	American bullfrog	7	0.085	Larva (Tadpole)	-	-	-	20	N.D.(2.4)	20	-						
					Coarse Particulate Organic Matter	-	-	-	-	Bottom fallen leaves	-	0.22	-	-	-	3.4	N.D.(0.38)	3.4	-		

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