Appendix F: Training and Testing Activities Matrices

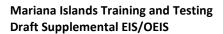
Supplemental Environmental Impact Statement/ Overseas Environmental Impact Statement

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APPENDIX F TRAINING AND TESTING ACTIVITIES MATRICES

This appendix contains three matrices. The first two matrices (Table F-1 and Table F-2) in this appendix list the training and testing activities that occur in the Mariana Islands Training and Testing Study Area and their associated stressors. The third matrix (Table F-3) lists the resources analyzed in this Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement and the stressors they are potentially affected by.



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Table F-1: Stressors by Training Activity

	Biolog	ical Re	sources																	Physical I	Resourc	ces			Huma	n Reso	urces²					
	Acoust	tic Stre	ssors		Explo	sives	Energy	Stresso	ors	Physico	al Distu	rbance	and Str	ike Stre	essors	Entang Stresso	lement ers	Ingestion Stressors		()		ents an	d Wate	er	Cultur Resou Stress	rce	Socioe Stresso	conom	ic		Health & Stresso	
Mariana Islands Training Activity	Sonar & Other Transducers	Vessel Noise	Aircraft Noise	Weapons Noise	In-Air Explosions	In-Water Explosions	In-Air Electromagnetic Devices	In-Water Electromagnetic Devices	High Energy Lasers	Vessels & In-water Devices	Aircraft & Aerial Targets	Military Expended Material	Seafloor Devices	Ground Disturbance	Wildfires	Wires & Cables	Decelerators/Parachutes	Military Expended Materials – Munitions	Military Expended Materials – Other than Munitions	Criteria Air Pollutants	Explosives	Metals	Chemicals	Other Materials ¹	Explosives 3	Physical Disturbance & Strike ⁴	Accessibility ⁵	Airborne Acoustics ⁶	Physical Disturbance & Strike ⁴	Underwater Energy 7	In-Air Energy ⁸	Physical Interactions 9
																		Legend					n numbe inal MIT								er of eve TEIS/OEI	
Major Training Exercises																																
Joint Expeditionary Exercise	✓	✓	√	√	✓	✓	✓	✓		✓	✓	✓				✓	√	✓	✓	√	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	√	✓
Joint Multi-Strike Group Exercise (decrease for Alt 1 only)	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓				✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Marine Air Ground Task Force Exercise (Amphibious) – Battalion	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓				✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Air Warfare (AW)																																
Air Combat Maneuver (ACM)			✓				✓				✓									✓		✓						✓	✓			
Air Defense Exercise (ADEX)		✓	✓				✓			✓	✓									✓						✓		✓	✓			✓
Air Intercept Control (AIC)			✓								✓									✓								✓	✓			
Gunnery Exercise (Air-to-Air) Medium-Caliber GUNEX A-A			✓	✓			✓				✓	✓						✓		✓		~				~	✓	✓	~			✓
Gunnery Exercise (Surface-to-Air) Large-Caliber GUNEX S-A		✓	✓	✓	✓		✓			✓	✓	✓						✓		✓	✓	✓		✓		✓	✓	✓	✓		✓	✓
Gunnery Exercise (Surface-to-Air) Medium-Caliber GUNEX S-A		✓	✓	√	✓		✓			*	√	✓						~		√		✓		√		✓	✓	*	1			✓
Missile Exercise (Air-to-Air) MISSILEX A-A		✓	✓	✓	~		✓			✓	✓	✓					✓	✓	✓	✓	1	1	✓			✓	✓	✓	✓			✓
Missile Exercise (Surface-to-Air) MISSILEX S-A		✓	✓	√	~		✓			✓	✓	✓						1	✓	✓	✓	✓	✓			~	✓	✓	~			✓
Amphibious Warfare (AW)																																
Amphibious Rehearsal, No Landing		✓								✓										✓						✓	✓		✓			✓

Amphibious Assault	1	✓				✓	✓					✓		✓	✓	✓		✓

Table F-1: Stressors by Training Activity (continued)

	Biolog	gical Re.	sources	;																Physical I	Resourc	es			Humar	n Resou	ırces²					
	Acous	stic Stre	ssors		Explo	sives	Energy	Stresso	rs	Physico	al Distu	rbance	and Str	ike Stre	ssors	Entang Stresso	lement ors	Ingestion Stressors		Air Quality Stressor	Sedim Qualit	ents an y Stress		r	Culture Resour Stresse	rce	Socioe				Health & Stressors	
Mariana Islands Training Activity	Sonar & Other Transducers	Vessel Noise	Aircraft Noise	Weapons Noise	In-Air Explosions	In-Water Explosions	In-Air Electromagnetic Devices	In-Water Electromagnetic Devices	High Energy Lasers	Vessels & In-water Devices	Aircraft & Aerial Targets	Military Expended Material	Seafloor Devices	Ground Disturbance	Wildfires	Wires & Cables	Decelerators/Parachutes	Military Expended Materials – Munitions	Military Expended Materials – Other than Munitions	Criteria Air Pollutants	Explosives	Metals	Chemicals	Other Materials ¹	Explosives ³	Physical Disturbance & Strike 4	Accessibility ⁵	Airborne Acoustics ⁶	Physical Disturbance & Strike 4	Underwater Energy 7	In-Air Energy ⁸	Physical Interactions ⁹
Amphibious Warfare (AW) (Contin	ued)		,	Π	Π		T	Π								Ι					T				Π							
Amphibious Raid		✓	✓							✓	✓									√						√	✓		✓			✓
Humanitarian Assistance/Disaster Relief Operations		✓	✓				✓			✓	✓									✓						✓	✓		✓			✓
Naval Surface Fire Support Exercise – Land-based target (Land) (increase Alt 2 only)		✓		✓	✓			✓		✓										✓							✓	✓				✓
Noncombatant Evacuation Operation		✓	✓				✓			✓	✓									✓		✓	✓	✓			✓		✓			✓
Special Purpose Marine Air Ground Task Force Exercise		✓	√	✓	✓	✓				✓	✓	√						✓	✓	✓	✓	✓	✓		✓	√	✓	✓	✓	✓	✓	✓
Unmanned Aerial Vehicle – Intelligence, Surveillance, and Reconnaissance			√								~									✓						√	~	✓	√			✓
Anti-Submarine Warfare (ASW)																																
Torpedo Exercise (TORPEX) – Helicopter (increase Alt 2 only)	✓	√	✓				✓			✓	~	✓				✓	✓	✓	√	✓		✓	√	✓		✓	✓	✓	✓	✓		✓
Torpedo Exercise (TORPEX) – Maritime Patrol Aircraft (increase Alt 2 only)	*		✓				✓			✓	~	✓				*	✓	✓	<	✓		\	\	✓		√	✓	✓	√	~		✓
Torpedo Exercise (TORPEX) – Submarine	✓	✓								✓		√				✓			>			✓				√			√	✓		✓
Torpedo Exercise (TORPEX) – Surface	✓	√					✓			✓		✓				✓	✓		√	✓		✓				√	✓	✓	✓	✓		✓
Tracking Exercise (TRACKEX) – Helicopter	✓		✓				✓			✓	✓	√				~	✓		✓	✓		✓	✓	✓		✓	√	✓	√	~		✓

Table F-1: Stressors by Training Activity (continued)

	Biolo	gical Re	sources	s																Physical I	Resourc	es			Humai	ı Resou	ırces²					
	Acous	stic Stre	essors		Explo	sives	Energy	Stresso	ors	Physic	al Distu	rbance	and Sti	rike Stro	essors	Entang Stresso	lement ors	Ingestion Stressors		Air Quality Stressor	Sedim Qualit			er	Culture Resour Stresse	rce	Socioe				Health &	
Mariana Islands Training Activity	Sonar & Other Transducers	Vessel Noise	Aircraft Noise	Weapons Noise	In-Air Explosions	In-Water Explosions	In-Air Electromagnetic Devices	In-Water Electromagnetic Devices	High Energy Lasers	Vessels & In-water Devices	Aircraft & Aerial Targets	Military Expended Material	Seafloor Devices	Ground Disturbance	Wildfires	Wires & Cables	Decelerators/Parachutes	Military Expended Materials – Munitions	Military Expended Materials – Other than Munitions	Criteria Air Pollutants	Explosives	Metals	Chemicals	Other Materials ¹	Explosives ³	Physical Disturbance & Strike 4	Accessibility ⁵	Airborne Acoustics ⁶	Physical Disturbance & Strike 4	Underwater Energy ⁷	In-Air Energy ⁸	Physical Interactions 9
Anti-Submarine Warfare (ASW) (Co	ontinue	d)																						ı								
Tracking Exercise (TRACKEX) – Maritime Patrol Aircraft	✓		✓				✓			✓	✓	✓				✓	✓		✓	✓		✓	✓	✓		✓	✓	✓	✓	✓		✓
Tracking Exercise (TRACKEX)— Submarine	✓	✓								✓		✓				✓						✓				✓			✓	✓		✓
Tracking Exercise (TRACKEX) – Surface	1	1					1	✓		~		✓				1				✓						✓	✓	✓	✓	✓		✓
Small Joint Coordinated ASW Exercise (Multi-Sail/GUAMEX)	~	✓	✓				✓			✓	✓	✓				~	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓
Electronic Warfare (EW)																																
Counter Targeting Chaff Exercise - Aircraft			✓								~	1							✓	✓				✓				✓				✓
Counter Targeting Chaff Exercise - Ship		✓								~		✓							✓	✓				✓			1					✓
Counter Targeting Flare Exercise – Aircraft			1				✓				✓	✓							✓	✓		✓		✓				✓				✓
Electronic Warfare Operations		✓	✓				✓			✓	✓									✓							✓	✓	✓			✓
Expeditionary Warfare																																
Parachute Insertion		✓	1							✓	✓									✓	✓			✓		✓	✓	✓	✓			✓
Personnel Insertion/Extraction		✓	✓							✓	✓									✓						✓	✓		✓			✓
Mine Warfare (MIW)																																
Civilian Port Defense	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓			✓	✓	✓	<	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Limpet Mine Neutralization System		✓				✓				✓										✓	✓	✓	✓			✓	✓	✓	✓	✓		✓

Table F-1: Stressors by Training Activity (continued)

	Biolo	gical Re	sources	5																Physical I	Resourc	es			Humar	ı Resou	ırces²					
	Acous	stic Stre	ssors		Explo	sives	Energy	/ Stresso	ers P	Physico	al Distu	rbance	and Str	ike Stre	essors	Entang Stresso	lement ors	Ingestion Stressors		Munity	Sedim Qualit	ents an y Stress		r	Culturo Resoui Stresso	rce	Socioe Stresso				Health & Stresso	
Mariana Islands Training Activity	Sonar & Other Transducers	Vessel Noise	Aircraft Noise	Weapons Noise	In-Air Explosions	In-Water Explosions	In-Air Electromagnetic Devices	In-Water Electromagnetic Devices	High Energy Lasers	Vessels & In-water Devices	Aircraft & Aerial Targets	Military Expended Material	Seafloor Devices	Ground Disturbance	Wildfires	Wires & Cables	Decelerators/Parachutes	Military Expended Materials – Munitions	Military Expended Materials – Other than Munitions	Criteria Air Pollutants	Explosives	Metals	Chemicals	Other Materials ¹	Explosives ³	Physical Disturbance & Strike 4	Accessibility ⁵	Airborne Acoustics ⁶	Physical Disturbance & Strike 4	Underwater Energy ⁷	In-Air Energy ⁸	Physical Interactions 9
Mine Warfare (MIW) (Continued)	T	1		1		T								T	1				1		T	, , , , , , , , , , , , , , , , , , ,										
Mine Neutralization – Remotely Operated Vehicle Sonar (ASQ-235 [AQS-20], SLQ-48)	✓	✓	✓			✓	✓	✓		✓	✓	✓	✓			✓		✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓		✓
Mine Countermeasure Exercise – Surface Ship Sonar (SQQ-32, MCM)	✓	✓					~			✓			✓							✓							✓			✓		✓
Mine Countermeasure – Towed Mine Neutralization		~	✓				~	~		✓	✓		✓							✓						✓	✓	✓	✓	✓	✓	✓
Airborne Mine Countermeasure – Towed Mine Detection	√	✓	✓							✓	✓		✓							✓						✓	1	✓	✓	✓	✓	✓
Mine Countermeasure Exercise – Towed Sonar (AQS-20, LCS)	√	✓					✓	✓		✓	✓		✓							✓	✓					✓	✓	✓	✓	✓		✓
Mine Laying		✓	✓								✓	✓	✓							✓		✓				✓	✓	✓	✓		1	✓
Mine Neutralization – Explosive Ordnance Disposal		✓	✓			✓				✓	✓	✓	✓					✓	√	√	✓	√	✓	✓	✓	✓	✓	✓	*	✓		✓
Submarine Mine Exercise	✓									✓		✓	✓																	✓		✓
Surface Ship Object Detection	✓	✓								✓			✓							✓						✓	✓		✓	✓	1	✓
Underwater Demolition Qualification/Certification		✓	✓		1	✓				✓	✓	✓	✓						✓	✓	1	✓	✓	✓	✓	✓	✓	✓	√	✓		✓
Strike Warfare (STW)										ı																						
Bombing Exercise (Air-to-Ground)			✓								✓	✓								✓		✓			✓	✓		✓				
Gunnery Exercise (Air-to-Ground)			✓	✓							✓	✓						✓		✓		✓			✓	✓		✓				
Missile Exercise (MISSILEX)		✓	✓	✓						✓	✓	✓								✓		✓			✓	✓		✓				

Table F-1: Stressors by Training Activity (continued)

	Biolog	ical Re	sources																	Physical	Resourc	es		ı	Human	Resou	ırces²					
	Acous	tic Stre	ssors		Explos	sives	Energy	y Stresso	ors	Physic	al Distu	rbance	and Sti	ike Stre	essors	Entanga Stresso		Ingestion Stressors		Air Quality Stressor		ents an y Stress	d Wate	r I	Cultura Resour Stresso	ce	Socioe Stresso				Health &	
Mariana Islands Training Activity	Sonar & Other Transducers	Vessel Noise	Aircraft Noise	Weapons Noise	In-Air Explosions	In-Water Explosions	In-Air Electromagnetic Devices	In-Water Electromagnetic Devices	High Energy Lasers	Vessels & In-water Devices	Aircraft & Aerial Targets	Military Expended Material	Seafloor Devices	Ground Disturbance	Wildfires	Wires & Cables	Decelerators/Parachutes	Military Expended Materials – Munitions	Military Expended Materials – Other than Munitions	Criteria Air Pollutants	Explosives	Metals	Chemicals	Other Materials ¹	Explosives ³	Physical Disturbance & Strike 4	Accessibility ⁵	Airborne Acoustics ⁶	Physical Disturbance & Strike ⁴	Underwater Energy 7	In-Air Energy ⁸	Physical Interactions 9
Surface Warfare (SUW)																																√
Bombing Exercise (Air-to-Surface) Gunnery Exercise (Air-to-Surface)		✓	✓	√		✓				✓	✓	√						√	✓	√	√	√			√	✓	✓	√	✓	✓	√	V
– Medium-Caliber		✓	✓	✓	✓	✓				✓	✓	✓						✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓		✓
Gunnery Exercise (Air-to-Surface) – Small-Caliber		✓	√	√						✓	✓	✓						✓	✓	✓		√				✓	✓	✓	√			✓
Gunnery Exercise (Surface-to- Surface) Boat – Small- and Medium-Caliber		✓		✓	✓					✓		✓						~	✓	✓	1	✓			✓	✓	✓	✓	✓	✓		~
Gunnery Exercise (Surface-to- Surface) Ship – Large-Caliber		✓		✓	✓	✓				✓		✓						✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓
Gunnery Exercise (Surface-to- Surface) Ship – Small- and Medium-Caliber		✓		√	*	✓	✓			✓		✓						~	√	~	~	√			✓	✓	✓	✓	√	~	~	~
Laser Targeting (at sea)		✓	✓						✓	✓	✓									✓							✓		✓		✓	✓
Maritime Security Operations		✓	✓	✓	✓	✓				✓	✓	✓						✓		✓	✓						✓	✓	✓	✓	✓	✓
Missile Exercise (Air-to-Surface) MISSILEX		✓	✓	✓	✓	✓	1			✓	✓	✓						✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
Missile Exercise (Air-to-Surface) Rocket		✓	✓	1	✓	✓	~		√	✓	✓	✓						✓	✓	✓	1	✓	✓		~	✓	✓	✓	✓	✓	✓	✓
Missile Exercise (Surface-to- Surface)		✓		\	✓	✓	✓		*	✓		✓						✓	√	√	✓	√	✓		✓	✓	✓	✓	✓	✓	✓	✓
Sinking Exercise		✓	✓	✓	✓	✓	✓			✓	✓	✓	✓			✓		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
Other Training Activities																																
Direct Action (Tactical Air Control Party)		✓	✓							✓	✓									✓												

Table F-1: Stressors by Training Activity (continued)

	Biolog	gical Re	esources	5										-			., (0011011			Physical	Resour	ces			Humai	n Resou	ırces²					
	Acous	stic Stre	essors		Explo	sives	Energy	/ Stresso	ors	Physic	al Distu	rbance	and St	rike Stre	essors	Entang Stresso	lement ors	Ingestion Stressors		Air Quality Stressor		ents ar	nd Wate	er	Culture Resour Stresse	rce	Socioe Stresso		ic		Health Stress	
Mariana Islands Training Activity	Sonar & Other Transducers	Vessel Noise	Aircraft Noise	Weapons Noise	In-Air Explosions	In-Water Explosions	In-Air Electromagnetic Devices	In-Water Electromagnetic Devices	High Energy Lasers	Vessels & In-water Devices	Aircraft & Aerial Targets	Military Expended Material	Seafloor Devices	Ground Disturbance	Wildfires	Wires & Cables	Decelerators/Parachutes	Military Expended Materials – Munitions	Military Expended Materials – Other than Munitions	Criteria Air Pollutants	Explosives	Metals	Chemicals	Other Materials ¹	Explosives ³	Physical Disturbance & Strike ⁴	Accessibility ⁵	Airborne Acoustics ⁶	Physical Disturbance & Strike ⁴	Underwater Energy ⁷	In-Air Energy ⁸	Physical Interactions ⁹
Other Training Activities (Continue													-																			
Intelligence, Surveillance, Reconnaissance		✓	✓							✓	✓					✓	✓		✓									✓	~	✓		✓
Precision Anchoring		✓								✓			✓							✓			✓	✓		✓	✓		✓			✓
Search and Rescue at Sea		✓	✓							✓	1	1								✓							✓	✓	✓	1		✓
Small Boat Attack (increase for Alt 2 only)		✓								~		✓						~	1	✓		1					✓	✓	✓		√	✓
Submarine Navigation	✓									✓																	✓	✓	✓	✓		✓
Submarine Sonar Maintenance	✓									✓																		✓		✓		
Surface Ship Sonar Maintenance	✓	✓					✓			✓										✓										✓		
Underwater Survey		✓								✓										✓						✓	✓					✓
Unmanned Aerial Vehicle Training and Certification		✓								✓	✓	✓								✓								✓				
Unmanned Underwater Vehicle Training	✓	✓								✓		✓	1							✓							✓	✓	1	✓	✓	✓
																	Legend				Decreas rom 201									in numl 5 Final M		

¹Other Materials include marine markers and flares, chaff, towed and stationary targets, and miscellaneous components of other expended objects

Note: A check indicates training and/or testing event that trigger the stressor as it applies to the specific resource.

² Area of interest is U.S. Territorial Waters (seaward of the mean high water line to 12 nautical miles and any inshore waters)

³ Vibration and shock waves from underwater explosions

⁴Physical disturbance and strike stressors resulting from in-water devices, military expended materials, seafloor devices, pile driving, and vibration from sonic booms in U.S. territorial waters (seaward of the mean high water line to 12 nautical miles).

⁵ Availability of access on the ocean and in the air

⁶Loud noises from weapons firing, in-air explosions, and sonic booms

⁷ Active sonar, underwater explosions, air guns, vessel movements, mine warfare training devices, and unmanned underwater systems

⁸ Sources of electromagnetic energy and lasers

⁹ Interaction of Navy or Marine Corps aircraft, vessels, and equipment with general public

Table F-2: Stressors by Testing Activity

	Biolog	gical Re.	sources	5																Physical	Resourc	es			Humai	n Resoi	urces ²				
		stic Stre			Explo	sives	Energy	stresso	ors	Physic	al Distu	rbance	and Sti	rike Stro	essors	Entang Stresso	lement ors	Ingestion :	Stressors	Air	Sedim	ents an y Stress		er	Culture Resour	al rce	Socioe Stresso				Health & Stressors
Mariana Islands Testing Activity	Sonar & Other Transducers	Vessel Noise	Aircraft Noise	Weapons Noise	In Air Explosions	In Water Explosions	In-Air Electromagnetic Devices	In-Water Electromagnetic Devices	High Energy Lasers	Vessels & In-water Devices	Aircraft & Aerial Targets	Military Expended Material	Seafloor Devices	Ground Disturbance	Wildfires	Wires & Cables	Decelerators/Parachutes	Military Expended Materials – Munitions	Military Expended Materials – Other than Munitions	Criteria Air Pollutants	Explosives	Metals	Chemicals	Other Materials ¹	Explosives ³	Physical Disturbance & Strike ⁴	Accessibility ⁵	Airborne Acoustics ⁶	Physical Disturbance & Strike ⁴	Underwater Energy ⁷	In-Air Energy ⁸ Physical Interactions ⁹
																	Legend				crease ir 1 2015 Fi										r of events EIS/OEIS
NAVAL AIR SYSTEMS COMMAND																															
Anti-Submarine Warfare (ASW)																															
Anti-Submarine Warfare Torpedo Test	~		✓				√			√	✓	✓	~			~	✓		✓	✓		✓	✓	~		✓	✓	✓	✓	√	✓
Anti-Submarine Warfare Tracking Test – Maritime Patrol Aircraft (Sonobuoys)	~	✓	✓		1	✓	√			√	~	✓				1	✓		✓	1	1	~	√	√	*	√	✓	✓	√	√	✓
Electronic Warfare (EW)																															
Intelligence, Surveillance, Reconnaissance ISR/EW Electronic Warfare Testing (previously named Broad Area Maritime Surveillance Testing – MQ-4C)							1				✓									1								✓			✓
Surface Warfare (SUW)															•																<u> </u>
Air-to-Surface Missile Test			✓	✓	✓	✓	✓				✓	✓						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
NAVAL SEA SYSTEMS COMMAND																															
Anti-Submarine Warfare (ASW)																															
Anti-Submarine Warfare Mission Package Testing	✓	✓	✓				✓			✓	✓	✓				✓	✓		✓	✓		✓	✓	✓		✓	✓	✓	✓	✓	✓ ✓
At-Sea Sonar Testing	✓						✓	✓				✓				✓				✓		✓		✓			✓	✓	✓	✓	✓ ✓
Torpedo (Explosive) Testing	✓	✓	✓			✓	✓			✓	✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓ ✓
Torpedo (Non-explosive) Testing	✓	✓	✓				✓			✓	✓	✓				✓	✓		✓	✓		✓	✓	✓		✓	✓	✓	✓	✓	✓ ✓
Electronic Warfare (EW)																															

Radar and Other System Testing	1	1		✓	✓	✓	✓	✓	~				✓		✓	~	1	~	✓	✓	~

Table F-2: Stressors by Testing Activity (continued)

	Biolog	gical Re	sources	i																Physical	Resourc	es			Human	Resou	ırces²					
	Acous	tic Stre	essors		Explo	sives	Energy	y Stresso	ors	Physico	al Distu	rbance	and Stı	ike Stre	essors	Entang Stresso	lement rs	Ingestion .	Stressors	Air Quality Stressor	Sedim Qualit	ents an y Stress		er	Cultura Resour Stresso	ce	Socioe Stresso		ic	Public Safety	Health Stresso	
Mariana Islands Testing Activity	Sonar & Other Transducers	Vessel Noise	Aircraft Noise	Weapons Noise	In Air Explosions	In Water Explosions	In-Air Electromagnetic Devices	In-Water Electromagnetic Devices	High Energy Lasers	Vessels & In-water Devices	Aircraft & Aerial Targets	Military Expended Material	Seafloor Devices	Ground Disturbance	Wildfires	Wires & Cables	Decelerators/Parachutes	Military Expended Materials – Munitions	Military Expended Materials – Other than Munitions	Criteria Air Pollutants	Explosives	Metals	Chemicals	Other Materials ¹	Explosives ³	Physical Disturbance & Strike 4	Accessibility ⁵	Airborne Acoustics ⁶	Physical Disturbance & Strike 4	Underwater Energy 7	In-Air Energy ⁸	Physical Interactions 9
Mine Warfare (MIW)	-																															
Mine Countermeasure and Neutralization Testing	✓	✓	✓			✓	✓	✓		✓	✓	✓	✓			✓		✓		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
Surface Warfare																																
Kinetic Energy Weapon Testing		>		✓	✓		✓			✓	✓	✓						✓	✓	*		>				✓	✓	✓	>		>	\
Vessel Evaluation																								_								
Undersea Warfare Testing	✓	✓	✓				✓			✓	✓	✓				✓	✓		✓	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓
Other Testing Activities				1	ı				ı												•											
Simulant Testing		✓	✓				✓			✓	✓									✓			✓	✓			✓	✓				✓
OFFICE OF NAVAL RESEARCH																																
Acoustic and Oceanographic Research		✓								✓			✓							✓							✓	✓	✓	✓	✓	✓
																	Legend				Decrease om 2015									in numb Final M		

¹Other Materials include marine markers and flares, chaff, towed and stationary targets, and miscellaneous components of other expended objects

Note: A check indicates training and/or testing events that trigger the stressor as it applies to the specific resource.

² Area of interest is U.S. Territorial Waters (seaward of the mean high water line to 12 nautical miles and any inshore waters)

³ Vibration and shock waves from underwater explosions.

⁴Physical disturbance and strike stressors resulting from in-water devices, military expended materials, seafloor devices, pile driving, and vibration from sonic booms in U.S. territorial waters (seaward of the mean high water line to 12 nautical miles).

⁵ Availability of access on the ocean and in the air

⁶Loud noises from weapons firing, in-air explosions, and sonic booms

⁷Active sonar, underwater explosions, air guns, vessel movements, mine warfare training devices, and unmanned underwater systems

⁸ Sources of electromagnetic energy and lasers

⁹ Interaction of Navy or Marine Corps aircraft, vessels, and equipment with general public

Table F-3: Stressors by Resource

		Biolog	gical Re	sources	!																Physical	Resourc			Human Resources ²								
Stressors vs. Resource		Acoustic Stressors				Explo	sives	Energy Stressors			Physical Disturbance and Strike Stressors						Entanglement Stressors		Ingestion Stressors C		Air Quality Stressor	Sedim Qualit		nd Wate							Public Health & Safety Stressors		
		Sonar & Other Transducers	Vessel Noise	Aircraft Noise	Weapons Noise	In Air Explosions	In Water Explosions	In-Air Electromagnetic Devices	In-Water Electromagnetic Devices	High Energy Lasers	Vessels & In-water Devices	Aircraft & Aerial Targets	Military Expended Material	Seafloor Devices	Ground Disturbance	Wildfires	Wires & Cables	Decelerators/Parachutes	Military Expended Materials – Munitions	Military Expended Materials – Other than Munitions	Criteria Air Pollutants	Explosives	Metals	Chemicals	Other Materials ¹	Explosives ³	Physical Disturbance & Strike ⁴	Accessibility ⁵	Airborne Acoustics ⁶	Physical Disturbance & Strike 4	Underwater Energy ⁷	In-Air Energy ⁸	Physical Interactions 9
Physical Resources	Sediments and Water Quality																					✓	1	✓	✓								
Phy Resc	Air Quality					✓															✓												
Human Resources Biological Resources	Marine Habitats						✓				✓		~	~																			
	Marine Mammals	<	✓	~	✓		✓		✓	✓	✓		~	~			<	✓	✓	✓		~	1	~	✓								
	Sea Turtles	~	✓	✓	✓		✓		✓	✓	✓		~	✓	✓		✓	✓	✓	✓		~	1	✓	✓								
	Marine Birds	√		✓	✓	✓	✓	~		✓	1	✓	✓						1	✓													
	Marine Vegetation						✓				✓		✓	~								✓	✓	✓	✓								
	Marine Invertebrates	✓					✓		✓		✓		✓	~			✓	✓	✓	✓		✓	✓	✓	✓								
	Fish	✓	√		✓		✓		✓	✓	✓		1	~	✓		✓	✓	✓	✓		~	1	1	✓								
	Terrestrial			✓	✓	1						1	~		✓	~																	
	Cultural Resources			✓			✓						~	~												✓	✓	✓	✓	✓			
	Socioeconomic Resources	✓	✓	✓	√	✓	✓	✓	✓		√	✓	1				✓	√				✓	1	✓	✓			√	✓	✓			
	Public Health and Safety	✓			√	✓	✓	~		✓	✓	1	✓	~										_							✓	✓	✓

Table F-3: Stressors by Resource (continued)

¹Other Materials include marine markers and flares, chaff, towed and stationary targets, and miscellaneous components of other expended objects

Note: A check indicates training and/or testing events that trigger the stressor as it applies to the specific resource.

² Area of interest is U.S. Territorial Waters (seaward of the mean high water line to 12 nautical miles and any inshore waters)

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⁹ Interaction of Navy or Marine Corps aircraft, vessels, and equipment with general public