Supplemental Environmental Impact Statement/

Overseas Environmental Impact Statement

Mariana Islands Training and Testing

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APPENDIX A TRAINING AND TESTING ACTIVITIES DESCRIPTIONS

A.1 TRAINING ACTIVITIES

The Navy's training activities are organized generally into eight primary mission areas and a miscellaneous category (Other Training) that includes those activities that do not fall within a primary mission area, but are an essential part of Navy training. In addition, because the Navy conducts a number of activities within larger training exercises, descriptions of those larger exercises are also included here. It is important to note that these larger exercises are comprised entirely of individual activities described in the primary mission areas.

A.1.1 Major Training Exercises

A major training exercise is comprised of several "unit level" range exercises conducted by several units operating together while commanded and controlled by a single commander. These exercises typically employ an exercise scenario developed to train and evaluate the strike group in naval tactical tasks. In a major training exercise, most of the operations and activities being directed and coordinated by the strike group commander are identical in nature to the operations conducted during individual, crew, and smaller-unit training events. In a major training exercise, however, these disparate training tasks are conducted in concert, rather than in isolation.

Major training exercises are listed below.

A.1.1.1 Joint Expeditionary Exercise

Maior Training	g Exercises – Medium Integra	ted Anti-Submarine Wa	arfare		
Joint Expedition					
Short	Typically a 10-day exercise that could include a Typical Duration				
Description	Carrier Strike Group and Ex Group, Marine Expeditional Infantry Units, and Air Force a joint environment that ind execution efforts as well as activities at sea, in the air, a	peditionary Strike ry Units, Army e aircraft together in cludes planning and military training	10 days		
Long Description	Advanced joint level battle group and expeditionary amphibious warfare exercise designed to create a cohesive Carrier and Expeditionary Strike Group. Typically 15 surface ships, amphibious assault craft, helicopters, maritime patrol aircraft, strike fighter aircraft, two submarines, and various unmanned vehicles. More than 8,000 personnel may participate and could include the combined assets of a Carrier Strike Group and Expeditionary Strike Group, Marine Expeditionary Units, Army Infantry Units, and Air Force aircraft.				
Typical Components	Platforms: Aircraft carrier, amphibious warfare ship, fixed-wing aircraft, rotary-wing aircraft, support craft, surface combatant Targets: Submarines Systems being Trained/Tested: Mid-frequency sonar systems, sonobuoys				
Standard	Aircraft safety	Typical Locations			
Operating Procedures (Section 2.3.3)	Towed in-water device safety Vessel safety	Range Complexes/Te Ranges: Mariana Islands Train Testing Study Area Mariana Islands Rang	ing and	Bays/Estuaries/Pierside: Apra Harbor	
Stressors to Biological Resources	Acoustic: Sonar and other transducer Aircraft noise Weapons noise Vessel noise Explosive: In-air explosions In-water explosions	Physical Disturbates Aircraft and aeriates Vessel and in-wate Military expende Ingestion: Military expende munitions Military expende other than mu	I targets er devices d materials d materials – d materials –	e: Energy: In-air electromagnetic devices In-water electromagnetic devices Entanglement: Decelerator/Parachutes Wires and cables	
Stressors to Physical Resources	Air Quality: Criteria air pollutants	Sediments and Water Quality: Metals Other materials Explosives Chemicals			
Stressors to Human Resources	Cultural Resources: Physical disturbance and strike Explosives	Socioeconomic R Accessibility Physical disturbal strike Airborne acoustic	nce and	Public Health and Safety: Underwater energy In-air energy Physical interactions	

Major Training	Major Training Exercises – Medium Integrated Anti-Submarine Warfare				
Joint Expeditio	nary Exercise				
Military	Ingestible Material:	Military	None		
Expended	Decelerators/parachutes - small	Recoverable			
Material	Non-Ingestible Material:	Material			
	Expended bathythermograph,				
	expended bathythermograph wire,				
	sonobuoy (non-explosive), sonobuoy				
	wires				
Sonar and	Mid-Frequency: Anti-Suk	marine Warfare	::		
Other	MF1 MF4 ASW2	ASW3			
Transducer	MF5 MF12				
Bins					
Explosive	None. Presented in appropriate workshe	ets for unit-leve	activities that could be conducted		
Bins	during this exercise.				
Procedural	Acoustic Stressors: (Section 5.3.2)	Physic	cal Disturbance and Strike Stressors:		
Mitigation	Active sonar	(Si	ection 5.3.4)		
Measures	Vessel movement				
		Towe	d in-water devices		
Assumptions	All military expended materials, ordnance, and explosives use is included in individual events.				
Used for	Additional activities utilizing sources not listed in the Sonar and Other Transducer Bins section				
Analysis	above may occur during this exercise. Al		· · · · · · · · · · · · · · · · · · ·		
	and testing activities have been account SEIS/OEIS.	ed for in the mod	deling and analysis presented in this		

A.1.1.2 Joint Multi-Strike Group Exercise

Major Training	Evereices				
	ike Group Exercise – Large I	ntegrated Ant	ti-Suhmarine Wa	rfare	
Short					ion
Description	Typically a 10-day Joint ex three carrier strike groups				1011
Description	training exercises simultar				
Long			monstrates the I	Navv's ah	oility to operate a large naval
Description		-		-	ner Services. In addition to
2 000 i p 0 0 i					ment to maintain, train, and
	equip combat-ready nava	•	•		
		-	_		t assets engaging in a "free
	play" battle scenario, with	n U.S. forces pi	itted against a re	plicated o	opposition force. The exercise
	provides realistic in-theat				
Typical	Platforms: Aircraft carrier	, fixed-wing ai	ircraft, rotary-wir	ng aircraf	t, submarines, surface
Components	combatant				
	Targets: Sub-surface targe				
	Systems being Trained/To			sonar sy	stems, sonobuoys
Standard	Aircraft safety	Typical Locat	tions		
Operating	Towed in-water device	Range Comp	olexes/Testing Ra	anges:	Bays/Estuaries/Pierside:
Procedures (Section	safety Vessel safety		ands Training and	_	Apra Harbor
2.3.3)	vesser sarety	Testing Stu	dy Area		
2.5.5)		Mariana Isl	ands Range Com	plex	
Stressors to	Acoustic:	Physical Dis	turbance and Str	ike:	Energy:
Biological	Sonar and other		aerial targets		In-Air electromagnetic
Resources	transducers		n-water devices		devices
	Aircraft noise	Military exp	ended materials		In-water electromagnetic
	Vessel noise	Ingestion:			devices
	Weapons noise	Military exp	ended materials	– other	
	Explosive:	than munition	ons		Entanglement:
	In-air explosions				Decelerator/Parachutes
	In-water explosions				Wires and cables
Stressors to	Air Quality:		Sediments and		
Physical	Criteria air pollutants		Metals		r materials
Resources		-	Explosives	Chem	
Stressors to	Cultural Resources:		nomic Resources	:	Public Health and Safety:
Human	Physical disturbance and	Accessibil	•	kudh a	Underwater energy
Resources	strike Explosives	Airborne	listurbance and s	trike	In-air energy Physical interactions
Militane	Ingestible Material:	Allborne	Military	None	Filysical interactions
Military Expended	Decelerators/parachutes -	- cmall	Recoverable	None	
Material	•	Siliali	Material		
Material	Non-Ingestible Material:		Waterial		
	Acoustic countermeasures				
	bathythermograph, expen				
	bathythermograph wire, s	-			
	(non-explosive), sonobuoy Mid-Frequency:	-			Itiah Fuancan
Camanarial	i iviia-Fredilency.	Anti-Sub	marine Warfare:		High-Frequency:
Sonar and					
Sonar and Other Transducer	MF1 MF3 MF4 MF5	ASW2 ASW4	ASW3		HF1

Major Training	Major Training Exercises				
Joint Multi-Stri	ke Group Exercise – Large Integrated Ant	i-Submarine Warfare			
Explosive		ets for unit-level activities that could be conducted			
Bins	during this exercise.				
	(6 (; 53.2)	DI : 10: 1			
Procedural	Acoustic Stressors: (Section 5.3.2)	Physical Disturbance and Strike Stressors:			
Mitigation	Active sonar	(Section 5.3.4)			
Measures		Vessel movement			
	Towed in-water devices				
Assumptions	All military expended materials, ordnance, and explosive use is included in individual events.				
Used for	Additional activities utilizing sources not listed in the Sonar and Other Transducer Bins section				
Analysis	above could be used during this exercise, and details can be found in the worksheets for those				
	explosive events. All acoustic sources wh	nich may be used during training and testing activities			
	have been accounted for in the modeling	g and analysis presented in this SEIS/OEIS.			

A.1.1.3 Marine Air Ground Task Force Exercise (Amphibious) - Battalion

	Exercises – Medium Coordina				
Marine Air Gro	und Task Force Exercise (Amp	hibious) -Battalion			
Short Description	Typically a 10-day exercise that conducts over the horizon, ship to objective maneuver for the elements of the Expeditionary Strike Group and the Amphibious Marine Air Ground Task Force. The exercise utilizes all elements of the Marine Air Ground Task Force (Amphibious), conducting training activities ashore with logistic support of the Expeditionary Strike Group and conducting amphibious landings.				
Long Description	This exercise conducts over the horizon, ship to objective maneuver of the elements of the Expeditionary Strike Group and the Amphibious Marine Air Ground Task Force. The exercise utilizes all elements of the task force to secure the battlespace (air, land, and sea), maneuver to and seize the objective, and conduct self-sustaining operations ashore with continual logistic support. Tinian is the primary training area for this exercise; however, elements of the exercise may be rehearsed nearshore and on Guam. The landing force is supported by all of the battalions assigned to a Marine Expeditionary Unit.				
Typical Components	Platforms: Amphibious warf Targets: None Systems being Trained/Test	fare ship, rotary-wing aircraft, surface ted: Sonar systems	e combatant		
Standard	Aircraft safety	Typical Locations			
Operating Procedures (Section 2.3.3)	Towed in-water device safety Vessel safety	Range Complexes/Testing Ranges: Mariana Islands Training and Testing Study Area to nearshore Mariana Islands Range Complex Tinian; Guam; Rota; Saipan; Farallon de Medinilla			
Stressors to Biological Resources	Acoustic: Sonar and other transducers Aircraft noise Vessel noise Weapons noise	Physical Disturbance and Strike: Aircraft and Aerial Targets Vessel and in-water devices Military expended materials Ingestion:	Energy: In-Air Electromagnetic Devices In-Water Electromagnetic Devices		
	Explosive: In-Air Explosions In-Water Explosions	Military Expended Materials – Entanglement: Other than Munitions Decelerators/Parachutes Wires and cables			
Stressors to Physical Resources	Air Quality: Criteria air pollutants	Sediments and Water Quality: Metals Other materials Explosives Chemicals			
Stressors to Human Resources	Cultural Resources: Explosives Physical disturbance and strike	Socioeconomic Resources: Accessibility Physical disturbance and strike Airborne Acoustics	Public Health and Safety: Underwater energy In-air energy Physical interactions		

Major Training Exercises – Medium Coordinated Anti-Submarine Warfare					
	und Task Force Exercise (Amphibious) -Ba				
Military	Ingestible Material:	Military	None		
Expended	None	Recoverable			
Material	Non-Ingestible Material: Expended bathythermograph, expended bathythermograph wire	Material			
Sonar and	Mid-Frequency: Anti-Su	bmarine Warfaı	e:		
Other	MF1 MF4 ASW3				
Transducer	MF12				
Bins					
Explosive	None. Presented in appropriate workshe	ets for unit-leve	l activities that could be conducted		
Bins	during this exercise.				
Procedural	Acoustic Stressors: (Section 5.3.2) Physical Disturbance and Strike				
Mitigation	Active sonar	:	Stressors: (Section 5.3.4)		
Measures			sel movement		
		Tow	ved in-water devices		
Assumptions	All military expended materials, ordnance, and explosive use is included in individual events.				
Used for	Additional activities utilizing sources not listed in the Sonar and Other Transducer Bins				
Analysis	section above may occur during this exercise. All acoustic sources which may be used during				
	training and testing activities have been	accounted for in	the modeling and analysis		
	presented in this SEIS/OEIS.				

A.1.2 AIR WARFARE TRAINING

Air warfare is the primary mission area that addresses combat operations by air and surface forces against hostile aircraft. Navy ships contain an array of modern anti-aircraft weapon systems, including naval guns linked to radar-directed fire-control systems, surface-to-air missile systems, and radar-controlled guns for close-in point defense. Strike/fighter aircraft carry anti-aircraft weapons, including air-to-air missiles and aircraft guns. Air warfare training encompasses events and exercises to train ship and aircraft crews in employment of these weapons systems against simulated threat aircraft or targets. Air warfare training includes surface-to-air gunnery, surface-to-air and air-to-air missile exercises, and aircraft force-on-force combat maneuvers.

A.1.2.1 Air Combat Maneuver

Air Warfare						
Air Combat Ma	neuver (ACM)					
Short	Aircrews engage in flight m	aneuvers design	ed to	Typical Dura	ntion	
Description	gain a tactical advantage during combat.			L–2 hours		
Long	_	=	aircrew eng	age in offen	sive and defensive maneuvering	
Description	against each other. During a	ng air combat maneuver engagements, no ordnance is fired, however, s chaff and flares may be used. These maneuvers typically involve two				
	aircraft; however, based up over a dozen aircraft.	on the training	requirement	t, air comba	t maneuver exercises may involve	
Typical	Platforms: Fixed-wing aircra	aft				
Components	Targets: Aircraft targets					
	Systems being Trained/Tes	sted: None				
Standard	Aircraft safety	Typical Locati	ons			
Operating		Range Compl	exes/Testin	g Ranges:	Bays/Estuaries/Pierside:	
Procedures		Mariana Islan			None	
(Section 2.3.3)		Testing Study	_		None	
		Special Use Ai		i y ai cas.		
Stressors to	Acoustic:	Physical Dist	-	Strike:	Energy:	
Biological	Aircraft noise	Aircraft and a			In-air electromagnetic	
Resources	Familianting	olosive: Ingestion:			devices	
	Explosive: None			Futanglement.		
	None	none			Entanglement: None	
Stressors to	Air Quality:	-	Sediments	and Water		
Physical	Criteria air pollutants		Metals		•	
Resources						
Stressors to	Cultural Resources:	Socioecon	omic Resou	rces:	Public Health and Safety:	
Human	None	Airborne a	coustics		None	
Resources		Physical di	sturbance ai	nd strike		
Military	Ingestible Material:		Military	None		
Expended	None		Recoverable	2		
Material	Non-Ingestible Material: None		Material			
Sonar and	None					
Other						
Transducer						
Bins						
Explosive Bins	None					
Procedural	None					
Mitigation						
Measures						
Assumptions		nd chaff may be	used. All flar	e and chaff	accounted for in flare exercise	
Used for Analysis	and chaff exercise events.					
	This activity occurs greater t	than 12 NM fror	n land (FDM	excepted).		

A.1.2.2 Air Defense Exercise

Air Warfare					
Air Wariare Air Defense Exe	roico (ADEV)				
		1 1 5 :	1 -	. 15 .:	
Short Description	Aircrew and ship crews comeasures against threat a missiles.		ical Duration hours		
Long Description	aircraft or missiles or redu detection through engage This exercise may include vessels, in fixed-wing aircr friendly aircraft to interce personnel on vessels use	nel perform measures designed to defend against attacking threat uce the effectiveness of such attack. This exercise involves full ement sequence. Aircraft operate at varying altitudes and speeds. Air Intercept Control exercises that involve aircraft controllers on raft, or at land-based locations use search radars to track and direct ept the threat aircraft, and Detect to engage exercises in which search radars in the process of detecting, classifying, and tracking sup to the point of engagement.			
Typical Components	Platforms: Surface vessels Targets: Aircraft targets Systems being Trained/T	_	raft		
Standard	Vessel safety	Typical Location	ns		
Operating Procedures (Section 2.3.3)	Aircraft safety	Range Complexes/Testing Ranges: Mariana Islands Training and Testing Study Area, Primary areas: Special Use Airspace Bays/Estuaries/Piers None			
Stressors to Biological Resources	Acoustic: Aircraft noise Vessel noise	Physical Disturbance and Strike: Energy: Aircraft and aerial targets In-Air Electromagnet Vessels and in-water devices Devices		In-Air Electromagnetic	
	Explosive: None	Ingestion: None		Entanglement: None	
Stressors to Physical Resources	Air Quality: Criteria air pollutants		ediments an one	nd Water Quality:	
Stressors to Human Resources	Cultural Resources: Physical disturbance and strike	Socioeconor Airborne acc Physical dist	oustics	Physical interactions	
Military Expended Material	Ingestible Material: None Non-Ingestible Material: None	Re	ilitary ecoverable aterial	None	
Sonar and Other Transducer Bins	None				
Explosive Bins	None				
Procedural Mitigation Measures	Physical Disturbance and Vessel movement	Strike Stressors:	(Section 5.3	3.4)	

Air Warfare		
Air Defense Exercise (ADEX)		
Assumptions	No munitions are fired.	
Used for		
Analysis		

A.1.2.3 Air Intercept Control

Air Warfare						
Air Intercept C	ontrol (AIC)					
Short Description	Aircrew and air controllers conduct aircraft intercepts of other aircraft. Typical Dur 1–2 hours			-	ation	
Long Description	Fighter jet aircrews maneuver to defend against threat aircraft.					
	An event involves two or more fighter aircraft.					
Typical Components	Platforms: Fixed-wing aircraft Targets: Aircraft Targets Systems being Trained/Tested: None					
Standard	Aircraft safety	Typical Loca	tions			
Operating Procedures (Section 2.3.3)					Bays/Estuaries/Pierside: None	
Stressors to	Acoustic:	-	sturbance and		Energy:	
Biological Resources	Aircraft noise		l aerial targets	•	None .	
	Explosive: None	Ingestion: None			Entanglement: None	
Stressors to Physical Resources	Air Quality: Criteria air pollutants	-	Sediments a None	ınd Water	Quality:	
Stressors to Human Resources	Cultural Resources: None	Airborne	nomic Resour acoustics Disturbance an		Public Health and Safety: None	
Military Expended Material	Ingestible Material: None Non-Ingestible Material: None		Military Recoverable Material	None		
Sonar and Other Transducer Bins	None			•		
Explosive Bins	None					
Procedural Mitigation Measures	None					
Assumptions Used for Analysis	No munitions are fired. This activity would occur gr	eater than 12	NM from land	d (FDM exc	cepted).	

A.1.2.4 Gunnery Exercise Air-to-Air Medium-Caliber

Air Warfare					
Gunnery Exerc	ise Air-to-Air Medium-Calibe	er (GUNEX A-	A)		
Short	Fixed-wing aircrews fire me	edium-caliber	Typical I	Duration	
Description	guns at air targets. 1–2 hours			rs	
Long Description	Fixed-wing aircrews maneuver aircraft in a gunnery pattern to achieve a weapons firing solution with integrated medium-caliber guns. Typically involves two or more fixed-wing aircraft and a target banner towed by a contract aircraft (e.g., Lear jet). The target banner is recovered after the event.				
Typical	Platforms: Fixed-wing aircr	raft			
Components	Targets: Air targets Systems being Trained/Te	sted: None			
Standard	Aircraft safety	Typical Loca	ations		
Operating Procedures (Section 2.3.3)	Weapons firing safety Target deployment and retrieval safety	Ranges: Mariana Isl Testing Stu	plexes/Testing ands Training an dy Area, Primary ial Use Airspace	1	
Stressors to Biological Resources	Acoustic: Aircraft noise Weapons noise	Physical Di Aircraft and	sturbance and S d aerial targets pended material	trike: Energy: In-air electromagnetic	
	Explosive: None	Ingestion: Military exp munition	Entanglement: s – None		
Stressors to Physical Resources	Air Quality: Criteria air pollutants	Sediments and Water Quality: Metals			
Stressors to Human Resources	Cultural Resources: Physical disturbance and strike	Socioeconomic Resources: Accessibility Airborne acoustics Physical disturbance and strike Public Health and Safety: Physical interactions			
Military Expended Material	Ingestible Material: Medium-caliber projectiles explosive), medium-caliber Non-Ingestible Material: N	(non- casings	Military Recoverable Material	Air target (towed target)	
Sonar and Other Transducer Bins	None				
Explosive Bins Procedural Mitigation Measures	None				

Air Warfare	
Gunnery Exerc	ise Air-to-Air Medium-Caliber (GUNEX A-A)
Assumptions	This activity is conducted at an altitude of 15,000 feet and above, during the daytime, and
Used for	beyond 12 nautical miles from shore (FDM excepted).
Analysis	
	A towed air target is a banner target and will be recovered. Only non-explosive munitions used.

A.1.2.5 Gunnery Exercise Surface-to-Air Large Caliber

Air Warfare						
	ise Surface-to-Air Large-Cal	iber (GUNEX	S-A)			
Short	Surface ship crews fire larg			Typical Du	ıration	
Description	targets.	ge-callbel gu		Up to 3 ho		
Long	_	- · · · · · · · · · · · · · · · · · · ·				
Description	Surface ship crews defend against threat aircraft or missiles with large-caliber guns to disable or					
Description	destroy the threat.					
	An event involves one ship and a simulated threat aircraft or missile that is detected by the					
	ship's radar. Large-caliber guns fire explosive and non-explosive projectiles at the threat before					
	it reaches the ship. The tar	it reaches the ship. The target is towed by a contract air services jet.				
Typical	Platforms: Surface combat	ant				
Components	Targets: Air targets					
	Systems being Trained/Te	sted: None				
Standard	Aircraft safety	Typical Loc	ations			
Operating	Weapons firing safety	Range Con	plexes/Test	ing	Bays/Estuaries/Pierside:	
Procedures	Vessel safety	Ranges:		. 0	None	
(Section 2.3.3)	Target deployment and retrieval safety	Mariana Isl	ands Trainin	g and		
2.3.3)	retrieval safety	Testing Stu	dy Area, Prir	mary		
		areas: Spec	cial Use Airsp	oace		
Stressors to	Acoustic:	Physical Di	isturbance a	nd Strike:	Energy:	
Biological	Aircraft noise	-	d aerial targe		In-air electromagnetic	
Resources	Weapons noise	Vessels and	d in-water de	evices	devices	
	Vessel noise	Military ex	pended mate	erials	Entanglement:	
	Explosive:	Ingestion:			None	
	In-air explosions	_	pended mate	erials –		
	•	munitio	-			
Stressors to	Air Quality:		Sediments	s and Wat	ter Quality:	
Physical	Criteria air pollutants		Metals		Other materials	
Resources			Explosives		<u>.</u>	
Stressors to	Cultural Resources:		onomic Reso	urces:	Public Health and Safety:	
Human	Physical disturbance and	Accessib	•		Physical interactions	
Resources	strike		acoustics	ورانسهم امرس	In-air energy	
D.d.iliha	lu acatible Material.		disturbance			
Military Expended	Ingestible Material: Large caliber projectile (ex		Recoverab		argets (towed target)	
Material	fragments	piosivej	Material	ile .		
Widterial	G		Widterial			
	Non-Ingestible Material:	10				
	Large caliber casings, Large projectile (non-explosive)	caliber				
Sonar and	None					
Sonar and Other	None					
Transducer						
Bins						
Explosive	None. Only in-air detonation	ons.				
Bins	and an accordance	- -				

Air Warfare						
Gunnery Exerc	Gunnery Exercise Surface-to-Air Large-Caliber (GUNEX S-A)					
Procedural	Acoustic Stressors (Section 5.3.2)	Physical Disturbance and Strike Stressors:				
Mitigation	Weapons firing noise	(Section 5.3.4)				
Measures		Vessel movement				
Assumptions	The target is a fiberglass-finned target that is towed approximately 3 nautical miles					
Used for	behind the towing aircraft.					
Analysis	All projectiles are assumed to be non-exp	losive or explode in-air well above the water's				
	surface.					
	This activity would occur greater than 12	NM from land (FDM excepted).				

A.1.2.6 Gunnery Exercise Surface-to-Air Medium-Caliber

Air Warfare					
	ise Surface-to-Air Medium-C	aliber (GUNE	X S-A)		
Short	Surface ship crews fire med	•		Typical Di	uration
Description	air targets.	alaili calibel g		1–2 hours	
Long Description	Surface ship crews defend against threat aircraft or missiles with medium-caliber guns to disable or destroy the threat. An event involves one ship and a simulated threat aircraft or anti-ship missile that is detected by the ship's radar. Medium-caliber guns fire non-explosive projectiles to disable or destroy the				
	threat before it reaches the	•	_	-	-
Typical Components	Platforms: Aircraft carrier, a Targets: Air targets Systems being Trained/Tes	·	varfare ship,	surface co	ombatant
Standard	Aircraft safety	Typical Loca	ations		
Operating Procedures (Section 2.3.3)	Weapons firing safety Vessel safety Target deployment and retrieval safety	Range Complexes/Testing Ranges: Mariana Islands Training and Testing Study Area, Primary areas: Special Use Airspace			Bays/Estuaries/Pierside: None
Stressors to Biological Resources	Acoustic: Aircraft noise Vessel noise Weapons noise Explosive: None	Physical Dis Aircraft and Vessels and Military exp Ingestion:	sturbance ard a aerial targe din-water de pended mate pended mate	ts vices erials	Energy: In-air electromagnetic devices Entanglement: None
Stressors to Physical Resources	Air Quality: Criteria air pollutants		Sediments Metals	and Wat	ter Quality:
Stressors to Human Resources	Cultural Resources: Physical disturbance and strike	Accessibi Airborne	ility acoustics disturbance		Public Health and Safety: Physical interactions
Military Expended Material	Ingestible Material: Medium-caliber projectiles explosive), medium-caliber Non-Ingestible Material: N	(non- casings	Military Recoverab Material	Air t	targets (towed target)
Sonar and Other Transducer Bins	None				
Explosive Bins	None.				
Procedural Mitigation Measures	None				

Air Warfare	
Gunnery Exerc	ise Surface-to-Air Medium-Caliber (GUNEX S-A)
Assumptions	The target is a fiberglass finned target that is towed approximately 3 nautical miles behind the
Used for	towing aircraft.
Analysis	This activity would occur greater than 12 NM from land (FDM excepted).

A.1.2.7 Missile Exercise Air-to-Air

Air Warfare					
Missile Exercis	e Air-to-Air (MISSILEX A-A)				
Short	Fixed-wing aircrews fire air	-to-air missiles	at air	Typical Du	ration
Description	targets.			1–2 hours	
Long Description	An event involves two or more fixed-wing aircraft and a target. Missiles are either high-explosive warheads or non-explosive practice munitions. The target is an unmanned aerial target drone a tactical air-launched decoy, or a parachute suspended illumination flare. Target drones deploy parachutes and are recovered by small boat or rotary-wing aircraft. Missiles may also be employed when training against threat missiles. These events typically occur at high altitudes.				
Typical Components	Platforms: Fixed-wing aircr Targets: Air targets Systems being Trained/Te		aft		
Standard	Aircraft safety	Typical Locat	ions		
Operating Procedures (Section 2.3.3)	Weapons firing safety Vessel safety Target Deployment and Retrieval Safety	Range Comp Ranges: Mariana Islar Testing Study Special Use A	nds Training / Area, Prim	and	Bays/Estuaries/Pierside: None
Stressors to Biological Resources	Acoustic: Aircraft noise Vessel noise Weapons noise Explosive: In-air explosions	Vessels and in-water devices devices Military expended materials Entanglement:			In-air electromagnetic devices Entanglement: Decelerators/parachutes
Stressors to	Air Quality:		Sediments	and Wate	er Quality:
Physical	Criteria air pollutants		Explosives		Chemicals
Resources	Criteria dii polididires		Metals	`	sireea.s
Stressors to	Cultural Resources:	Socioecon		urces:	Public Health and Safety:
Human Resources	Physical disturbance and strike	Socioeconomic Resources: Public Health and Safety: Accessibility Physical interactions Airborne acoustics Physical disturbance and strike			
Military	Ingestible Material:		Military		argets (drones, air-launched
Expended Material	Missile (explosive) fragmen Non-Ingestible Material: Air target (decoy), illuminated decelerators/parachutes — and large, end caps, o-ring	its tion flares,	Recoverab Material	l e de	coy, or illumination flare, see gure A-1, Figure A-2, Figure A-3)
Sonar and Other Transducer Bins	None	_			

Air Warfare					
Missile Exercise	Missile Exercise Air-to-Air (MISSILEX A-A)				
Explosive	None. Only in-air detonations.				
Bins					
Procedural	None				
Mitigation					
Measures					
Assumptions	Assumes that all missiles are explosive, although non-explosive practice munitions may be				
Used for	used. All missiles explode at high altitude.				
Analysis	All propellant and explosives are consumed.				
	Tactical air-launched decoys and illumination flares are expended and not recovered.				
	This activity would occur greater than 12 NM from land (FDM excepted).				



Figure A-1: BQM-74 (Aerial Target)

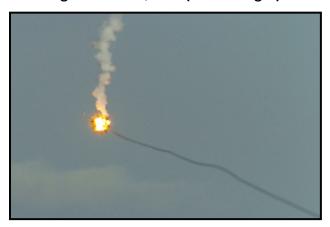


Figure A-2: LUU-2B/B Illuminating Flare (Aerial Target)



Figure A-3: Tactical Air-Launched Decoy (Aerial Target)

A.1.2.8 Missile Exercise Surface-to-Air

Air Warfare							
	e Surface-to-Air (MISSILEX S-	-A)					
Short	Surface ship crews fire surf		ilos at Tv	pical Duration			
Description	air targets.	ace-to-all Illis		2 hours			
•		against throat					
Long Description	missiles.	d against threat missiles and aircraft with ship-launched surface-to-air					
Description	missies.						
	The event involves a simulated threat aircraft or anti-ship missile which is detected by the ship						
	radar. Ship-launched surfac	radar. Ship-launched surface-to-air missiles are fired (high-explosive) to disable or destroy the					
	threat. The target typically is a remote-controlled drone. Surface-to-air missiles may also be						
	used to train against land a	ttack missiles.					
Typical	Platforms: Aircraft carrier,	amphibious w	arfare ship, ro	tary-wing aircraft, surface combatant			
Components	Targets: Air targets						
	Systems being Trained/Te	sted: None					
Standard	Aircraft safety	Typical Locat	ions				
Operating Procedures	Weapons firing safety	Range Comp	lexes/Testing	Bays/Estuaries/Pierside:			
	Vessel safety	Ranges:		None			
(Section 2.3.3)	Target deployment and retrieval safety	Mariana Islar	nds Training a	nd			
2.3.3)	retrieval safety	Testing Study	Area, Primar	y areas:			
		Special Use A	irspace				
Stressors to	Acoustic:	Physical Dist	turbance and	Strike: Energy:			
Biological	Aircraft noise	Aircraft and	aerial targets	In-air electromagnetic			
Resources	Vessel noise	Vessels and	in-water devi	ces devices			
	Weapons noise	noise Military expended materials Entanglement:					
	Explosive:	Ingestion:		Decelerators/parachutes			
	In-air explosions	-	ended materi:				
	тт ит ехртозгоно	Military expended materials – munitions Military expended materials – other					
		than mur					
Stressors to	Air Quality:		Sediments a	nd Water Quality:			
Physical	Criteria air pollutants						
Resources			Metals				
Stressors to	Cultural Resources:	Socioecon	omic Resour	ces: Public Health and Safety:			
Human	Physical disturbance and	Accessibili	ty	Physical interactions			
Resources	strike	Airborne a	coustics				
		Physical d	isturbance an	d strike			
Military	Ingestible Material:		Military	Air targets (decoy or drone)			
Expended	Missile (explosive) fragmen	its	Recoverable				
Material	Non-Ingestible Material:		Material				
	decelerators/parachutes –	medium					
	and large	mediam					
Sonar and	None						
Other							
Transducer							
Bins							
Explosive	None. Only in-air detonatio	ns.					
Bins							

Air Warfare	
Missile Exercis	e Surface-to-Air (MISSILEX S-A)
Procedural	Acoustic Stressors (Section 5.3.2)
Mitigation	Weapons firing noise
Measures	Physical Disturbance and Strike Stressors: (Section 5.3.4) Vessel movement
Assumptions Used for Analysis	Assumes that all surface-to-air missiles are high-explosive. Missile explodes well above surface. All explosive and propellant are consumed. Target typically not destroyed, unmanned drones are recovered when possible. This activity would occur greater than 12 NM from land (FDM exempt).

A.1.3 AMPHIBIOUS WARFARE TRAINING

Amphibious warfare is a type of naval warfare involving the utilization of naval firepower, logistics, and Marine Corps landing forces to project military power ashore. Amphibious warfare encompasses a broad spectrum of activities involving maneuver from the sea to objectives ashore, ranging from reconnaissance or raid missions involving a small unit, to large-scale amphibious operations involving over one thousand Marines and Sailors, and multiple ships and aircraft embarked in a strike group.

Amphibious warfare training includes tasks at increasing levels of complexity, from individual, crew, and small unit events to large task force exercises. Individual and crew training include the operation of amphibious vehicles and naval gunfire support training. Small-unit training activities include shore assaults, boat raids, airfield or port seizures, and reconnaissance. Larger-scale amphibious exercises involve ship-to-shore maneuver, shore bombardment and other naval fire support, and air strike and close air support training.

A.1.3.1 Amphibious Rehearsal, No Landing

Amphibious W	larfare				
	ehearsal, No Landing				
Short Description	Amphibious shipping, land of the Marine Air Ground 1	mphibious shipping, landing craft, and aviation elements the Marine Air Ground Task Force rehearse amphibious nding operations without conducting an actual landing a shore. Typical Duration 1–2 days			
Long Description	craft including hovercraft, ship, and task force aircraf approach shore without la	combat rubb t in assault la nding.	er raiding craft, a nding rehearsals	armored . Assault	launch and recover landing amphibious craft, landing craft t craft form landing waves and
Typical Components	Platforms: Amphibious warfare ship, fleet support ship, small boat Targets: None Systems being Trained/Tested: None				
Standard Operating Procedures (Section 2.3.3)	Vessel safety	Range Complexes/Testing Ranges: Mariana Islands Training and Testing Study Area and Nearshore			Bays/Estuaries/Pierside: Apra Harbor
Stressors to Biological Resources	Acoustic: Vessel noise Explosive: None	Physical Disturbance and Strike: Vessel and in-water devices Ingestion: None			Energy: None Entanglement: None
Stressors to Physical Resources	Air Quality: Criteria air pollutants	Sediments and Water Quality: None			Quality:
Stressors to Human Resources	Cultural Resources: Physical disturbance and strike	Socioeconomic Resources: Accessibility Physical disturbance and strike			Public Health and Safety: Physical interactions
Military Expended Material	Ingestible Material: None Non-Ingestible Material: None	Military Nor Recoverable Material			

Amphibious W	arfare
Amphibious Re	ehearsal, No Landing
Sonar and	None
Other	
Transducer	
Bins	
Explosive	None
Bins	
Procedural	Physical Disturbance and Strike Stressors: (Section 5.3.4)
Mitigation	Vessel movement
Measures	
Assumptions	Amphibious vehicles train to launch from, and return to, amphibious ships. Amphibious vehicles
Used for	approach surf zone but turn away before entering surf zone or landing zone. Typical
Analysis	participants: amphibious vessels (e.g., LHA or LHD, LPD, LSD), landing craft (Landing Craft, Air
	Cushioned; Landing Craft, Utility), and amphibious assault vehicles.

A.1.3.2 Amphibious Assault

Amphibious W	arfare						
Amphibious As							
Short	Large unit forces move ash	ore from amphibi	ous Ty	oical Duration			
Description	ships at sea for the immed	iate execution of	Un	Jp to 2 weeks			
	inland objectives.		l ob	to 2 Weeks			
Long	Landing forces embarked in	n vessels, craft, or	tilt-rotor a	nd helicopters	s launch an attack from		
Description	the sea onto a hostile shore. Amphibious assault is conducted for the purposes of prosecuting						
	further combat operations, obtaining a site for an advanced naval or airbase, or denying the						
	enemy use of an area.	an area.					
	Unit-Level Training exercise	ises involve one or more amphibious ships, and their associated					
	watercraft and aircraft, to	•		-			
	command and control and				_		
	practice loading, unloading	g, and movement,	and to dev	elop the timir	ng required for a full-		
Tomical	scale exercise.	ufana alaina fissaal ss	i i		ainemaft tilt mateu ainemaft		
Typical Components	Platforms: Amphibious wa small boat	rrare snip, fixed-w	ing aircrai	i, rotary-wing	aircrait, tiit-rotor aircrait,		
Components	Targets: None						
	Systems being Trained/Te	sted: None					
Standard	Vessel safety	Typical Location	s				
Operating	Aircraft safety	Range Complexe	os /Tosting	Pa	ys/Estuaries/Pierside:		
Procedures	Amphibious assault and	Ranges:	es/ resumg		nian; Guam		
(Section	amphibious raid	Mariana Islands Range Complex					
2.3.3)	procedures	Tinian; Guam					
Stressors to	Acoustic:	Physical Disturbance and Strike: Energy:					
Biological	Aircraft noise	Aircraft and aer	•		None		
Resources	Vessel noise	Vessels and in-v	vater devi	es	Entanglement:		
	Explosive:	Ingestion:			None		
	None	None		-			
Stressors to	Air Quality:			nd Water Qua	ality:		
Physical Resources	Criteria air pollutants	No	ne				
Stressors to	Cultural Resources:	Socioeconom	ic Resour	oc. Dii	blic Health and Safety:		
Human	Physical disturbance and	Accessibility	ic nesour		ysical interactions		
Resources	strike	Physical distu	rbance an		,		
Military	Ingestible Material:	Mil	itary	None			
Expended	None	Red	overable				
Material	Non-Ingestible Material:	Ma	terial				
	None						
Sonar and	None	•					
Other							
Transducer							
Bins	N						
Explosive	None						
Bins Procedural	Dhysical Disturbance and S	Strika Strassars: /C	action E ?	<u>//</u>			
Mitigation	Physical Disturbance and Strike Stressors: (Section 5.3.4) Vessel movement						
Measures	V COSCI III O V CIII CIII						

Amphibious Warfare				
Amphibious As	sault			
Assumptions	Typical event: 1–3 amphibious ships (e.g., LHA or LHD, LPD, LSD); 2-8 landing craft (landing			
Used for	craft, air cushioned; landing craft, utility); 4–14 amphibious assault vehicles; up to 22 aircraft			
Analysis	(e.g., MH-53, H-46/MV-22, AH-1, UH-1, AV-8); a Marine Expeditionary Unit (2,200 Marines).			

A.1.3.3 Amphibious Raid

Amphibious W	arfare						
Amphibious Ra							
Short	Small unit forces move fror	m amphibious	ships at	Typical D	Ouration		
Description	sea for a specific short-tern quick operations with as fe possible.	n mission. The	se are	4–8 hour			
Long Description	Small unit forces swiftly move from amphibious vessels at sea into hostile territory for a specific mission, including a planned withdrawal. Raids are conducted to inflict loss or damage, secure information, create a diversion, confuse the enemy, or capture or evacuate individuals or material. Amphibious raid forces are kept as small as possible to maximize stealth and speed of the operation. An event may employ assault amphibian vehicle units, small boats, combat swimmers, small unit live-fire and non-live-fire operations. Surveillance or reconnaissance unmanned surface and aerial vehicles may be used during this event. Events are also conducted to train in the delivery of humanitarian assistance to remote locations or areas requiring assistance after natural disasters.						
Typical Components	Platforms: Amphibious war Targets: Land Targets Systems being Trained/Te	rfare ship, small boat, unmanned aerial system-fixed wing sted: None					
Standard	Vessel safety	Typical Locations					
Operating Procedures (Section 2.3.3)	Aircraft safety Amphibious assault and amphibious raid procedures	Range Complexes/Testing Ranges: Mariana Islands Range Complex Tinian; Guam; Rota			Bays/Estuaries/Pierside: Tinian; Guam		
Stressors to Biological Resources	Acoustic: Aircraft noise Vessel noise Explosive: None	Physical Disturbance and Strike: Aircraft and aerial target Vessels and in-water devices Ingestion:			: Energy: None Entanglement: None		
Stressors to Physical Resources	Air Quality: Criteria air pollutants	None	Sediment None	s and Wa	iter Quality:		
Stressors to Human Resources	Cultural Resources: Physical disturbance and strike	Socioeconomic Resources: Accessibility Physical disturbance and strike			Public Health and Safety: Physical interactions e		
Military Expended Material	Ingestible Material: None Non-Ingestible Material: None	Military None Recoverable Material			-		
Sonar and Other Transducer Bins	None	<u>.</u>					
Explosive Bins	None						

Amphibious W	Amphibious Warfare					
Amphibious Ra	Amphibious Raid					
Procedural	Physical Disturbance and Strike Stressors: (Section 5.3.4)					
Mitigation	Vessel movement					
Measures						
Assumptions	Weapons firing (if conducted) during this event is discussed in appropriate activity					
Used for	descriptions (e.g., surface-to-surface and air-to-surface small-caliber gunnery					
Analysis	exercises).					
	During the conduct of amphibious raids personnel may exit the watercraft in the surf zone and					
	divers and combat swimmers will stand in the surf zone and walk onto the beach.					

A.1.3.4 Humanitarian Assistance Operations/Disaster Relief Operations

Amphibious W	arfare						
	Assistance Operations/Disas	ter Relief Opera	ations				
Short	Military units provide hum			Typica	l Durat	ion	
Description	times of disaster.	Up to 2			Il Duration		
_							
Long	•	anitarian assistance and disaster relief in times of natural disaster. pious landing crafts could be expected to participate in this operation					
Description	•	_		-			ration
	during day or night. The rapid movement of relief supplies and logistics from ships and a logistic "hub" during extreme conditions is practiced during this event.						
Typical							
Components	and small boat	arfare ship, fixed-wing aircraft, rotary-wing aircraft, tilt-rotor aircraft,					
Components							
	Targets: None Systems being Trained/Tested: None						
Standard	Aircraft safety	Typical Location	onc				
	Vessel safety	Typical Locatio	ons				
Operating Procedures	vessersarety	Range Comple	exes/Test	ting	-	Bays/Estuaries/Piersid	le:
(Section		Ranges:				Guam; Tinian; Rota; Sai	ipan
2.3.3)		Mariana Island	ds Range	Comple	ex;		
2.3.3)		Guam; Tinian;	Rota; Sa	ipan			
Stressors to	Acoustic:	Physical Disturbance and Strike:			ke:	Energy:	
Biological	Aircraft noise	Aircraft and a	erial targ	gets		In-air electromagnet	tic
Resources	Vessel noise	Vessels and in-water devices devices					
	Explosive:	Ingestion:				Entanglement:	
	None	None				None	
Stressors to	Air Quality:	-	Sadiman	ts and \	Nator C		
Physical	Criteria air pollutants	Sediments and Water None			water C	zuanty.	
Resources	Criteria dii poliutarits		None				
Stressors to	Cultural Resources:	Socioecono	mic Res	ources:		Public Health and Safe	tv
Human	Physical disturbance and	Accessibilit		ources.		Physical interactions	cy.
Resources	strike	Physical dis	•	and str		Thysical interactions	
Military	Ingestible Material:		Military		None		
Expended	None		Recovera		vonc		
Material			Material				
	Non-Ingestible Material:						
	None						
Sonar and	None						
Other							
Transducer							
Bins							
Explosive	None						
Bins							
Procedural	Physical Disturbance and S	Strike Stressors:	(Section	5.3.4)			
Mitigation	Vessel movement						
Measures							
Assumptions	Sea-, land-, and air-based a	ctivity. Logistics	and aid	distribu	ted acr	oss island region via "hu	ub"
Used for	location.						
Analysis							

A.1.3.5 Naval Surface Fire Support Exercise – Land-Based Target

Amphibious W	larfara						
•		Pasad Targe					
	Fire Support Exercise – Land						
Short	Surface ship crews fire larg	_		Typical D			
Description	land-based targets in supp						
Long		e-caliber guns to support forces ashore.					
Description	One or more ships position	themselves offshore the target area and a land-based spotter					
	relays type and exact locati	tion of the target. After observing the fall of the shot, the spotter					
	relays any adjustments nee	eded to reach the target. Once the rounds are on target, the spotter er to effectively destroy the target.					
	requests a sufficient numbe						
	This exercise occurs on land	d ranges where high-explosive and non-explosive practice ordnance supported by target shapes on the ground.					
Typical	Platforms: Surface combat	ant					
Components	Targets: Land targets						
	Systems being Trained/Tes	ted: None					
Standard	Vessel safety	Typical Loca	ations				
Operating	Weapons firing safety	Pange Com	plexes/Test	ina	Bays/Estuaries/Pierside:		
Procedures	Farallon de Medinilla	Ranges:	piekes/ rest	шБ	None		
(Section	Access Restrictions	_	Farallon de	Medinilla	None		
2.3.3)		_					
Stressors to	Acoustic:	=	sturbance a				
Biological	Vessel noise		d in-water de	evices	In-water electromagnetic		
Resources	Weapons noise	Ingestion: devices					
		None			Entanglement:		
	Explosive:		None				
	In-air explosions						
Stressors to	Air Quality:	-	Sediment	s and Wat	ter Quality:		
Physical	Criteria air pollutants		None		•		
Resources							
Stressors to	Cultural Resources:	Socioeco	nomic Reso	urces:	Public Health and Safety:		
Human	None	Accessib	ility		Physical interactions		
Resources		Airborne	acoustics				
Military	Ingestible Material:		Military	Nor	ne		
Expended	None		Recoverab	le			
Material	Non-Ingestible Material:		Material				
	Large caliber casings						
Sonar and	None						
Other	None						
Transducer							
Bins							
Explosive	None						
Bins	None						
Procedural	Acoustic Stressors: (Section	15321	Dhye	ical Distu	rhance and Strike Stressors:		
Mitigation	Acoustic Stressors: (Section 5.3.2) Physical Disturbance and Strike Stressors: Weapons firing noise (Section 5.3.4)						
Measures	Treapons ming noise	Vessel movement					
Assumptions	Projectile impact is on land	· however no			vater impacts are considered.		
Used for	Ojecine impaci is on land	, ποννενεί, με	zerreiai ricai	5.101 C 111-V	rate. Impacts are considered.		
Analysis							
Allulysis							

A.1.3.6 Noncombatant Evacuation Operation

Amphibious Warfa	are					
· · · · · · · · · · · · · · · · · · ·	acuation Operation					
Short	Military units evacuate no	oncombatants fro	m Typ	pical Duration		
Description	hostile or unsafe areas		5 d			
Long Description	Military units evacuate noncombatants from hostile or unsafe areas to safe havens. Non-Combatant Evacuation Operation is conducted by military units, usually operating in conjunction with Navy ships and aircraft. Noncombatants are evacuated when their lives are endangered by war, civil unrest, or natural disaster. Expeditionary units train for evacuations in hostile environments that may require the use of force. Helicopters, landing crafts, and combat swimmers could be expected to participate in this operation during day or night.					
Typical Components	Platforms: Amphibious warfare ship, surface vessels, fixed-wing aircraft, rotary-wing aircraft, tilt rotor aircraft, unmanned aerial vehicles Targets: None Systems Being Trained/Tested: None					
Standard	Aircraft safety	Typical Location	ıs			
Operating Procedures (Section 2.3.3)	Vessel safety Unmanned aerial and underwater vehicle procedures	Range Complexes/Testing Ranges: Mariana Islands Range Complex Guam; Tinian; Rota		Bays/Estuaries/Pierside: None plex		
Stressors to Biological Resources	Acoustic: Aircraft noise Vessel noise Explosives: None	Physical Disturbance and Strik Aircraft and aerial targets Vessels and in-water devices Ingestion: None		In-air electromagnetic devices		
Stressors to Physical Resources	Air Quality: Criteria air pollutants	Sediments and Water Quality: Metals Chemicals Other materials				
Stressors to	Cultural Resources:	Socioeconon	nic Resource	s: Public Health and Safety:		
Human	Physical disturbance and	Accessibility		Physical interactions		
Resources	strike	Physical distu	ırbance and	strike		
Military Expended Material	Ingestible Material: None Non-Ingestible Material: None	_		None		
Sonar and Other Transducer Bins	None					
In-Water Explosive Bins	None					
Procedural Mitigation Measures	Physical Disturbance and Vessel movement	Strike Stressors:	(Section 5.3.	4)		
Assumptions Used for Analysis	Sea-, land-, and air-based	activity				

A.1.3.7 Special Purpose Marine Air Ground Task Force Exercise

Amphibious W	arfare							
Special Purpos	e Marine Air-Ground Task Force	Exercise						
Short	Typically a 10-day exercise sim	ilar to Marine	Air Ty r	oical Dura	tion			
Description	Ground Task Force (Amphibioเ	ıs) – Battalion,	but					
	task organized to conduct a sp	ecific mission (e.g.,	days				
	Humanitarian Assistance, Disa:	ster Relief,	10	uays				
	Noncombatant Evacuation Op-	erations).						
Long	Special Purpose Marine Air Gro	round Task Force, operating in conjunction with Navy ships and aircraft,						
Description	typically conduct humanitariar							
		ack to the United States when their lives are endangered by war, civil						
		-			e host country; however, Marine			
	Corps Special Purpose Marine			-				
	Operations Capable) normally							
					the rapid introduction of forces,			
		ints, and a plar	ined withdray	wal. The a	ctivity is conducted during day or			
	night.	1. 6. 1 .						
Typical	Platforms: Amphibious warfare	e snip, fixed-wi	ng aircraft, ro	tary-wing	g aircraft, tilt-rotor aircraft,			
Components	small boat							
	Targets: None	ted None						
Standard	Systems being Trained/Tested	Typical Locations						
Operating	Aircraft safety Vessel safety	турісаї госац	ons					
Procedures	vessersarety	Range Complexes/Testing			Bays/Estuaries/Pierside:			
(Section		Ranges:			None			
2.3.3)		Mariana Islan	ds Training a	nd				
2.3.3)		Testing Study						
		Mariana Islan	_	=				
		Tinian; Guam	•	-				
Stressors to	Acoustic:	Physical Dist		Strike:	Energy:			
Biological	Aircraft noise	Aircraft and a	-		None			
Resources	Vessel noise	Vessel and in						
	Weapons noise	Military expe	nded materia	IIS	Entanglement:			
	Explosive:	Ingestion:			None			
	In-air explosions	Military expe	nded materia	ıls –				
	In-water explosions	munitions						
		Military expe	nded materia	ıls – other	•			
		than muni						
Stressors to	Air Quality:		Sediments ar	nd Water	Quality:			
Physical	Criteria air pollutants		Explosives					
Resources			Metals					
			Chemicals					
Stressors to	Cultural Resources:		omic Resourc	es:	Public Health and Safety:			
Human	Physical disturbance and strike		•		Physical interactions			
Resources	Explosives	Physical disturbance and strike Underwater energy						
		Airborne a		T	In-Air Energy			
Military	Ingestible Material:		Military	None				
Expended	None		Recoverable					
Material	Non-Ingestible Material:		Material					
	None							
			_					

Amphibious W	/arfare
Special Purpos	e Marine Air-Ground Task Force Exercise
Sonar and	None
Other	
Transducer	
Bins	
Explosive	None
Bins	
Procedural	Physical Disturbance and Strike Stressors: (Section 5.3.4)
Mitigation	Vessel movement
Measures	
Assumptions	Impacts from land based targeting are not analyzed. Only the at-sea components of this activity are
Used for	analyzed in this document.
Analysis	Additional activities utilizing sources not listed in the Sonar and Other Transducer Bins section above
	may occur during this exercise. All acoustic sources that may be used during training and testing
	activities have been accounted for in the modeling and analysis presented in this EIS/OEIS.

A.1.3.8 Unmanned Aerial Vehicle – Intelligence, Surveillance, and Reconnaissance

Amphibious Warfai	re						
Unmanned Aerial V	/ehicle – Intelligence, Surveil	lance, ar	d Reconnaissance	2			
Short Description	Military units employ unma	anned ae	rial vehicles to		Typical D	uration	
	launch, operate, and gathe	r intellig	ence for specified		Varies		
	amphibious missions.				Varies		
Long Description	Unmanned aerial vehicles r	-		s, boa	its, submar	ines, or ground and are	
	used to gather tactical or th						
Typical	_	Platforms: Fixed-wing aircraft, unmanned aerial system – fixed wing, unmanned aerial system –					
Components	rotary wing						
	Targets: None						
	Systems being Trained/Tes	sted: No					
Standard	Aircraft safety		Typical Locations	5			
Operating	Unmanned aerial and unde	rwater	Range Complexe	es/Tes	sting	Bays/Estuaries/Pierside:	
Procedures	vehicle procedures		Ranges:	•	Ū	None	
(Section 2.3.3)			Mariana Islands	Traini	ng and		
			Testing Study Are	ea			
Stressors to	Acoustic: Physical Disturbance and Strike:			Energy:			
Biological	Aircraft noise Ai	ircraft ar	id aerial targets			None	
Resources	Explosives: In	gestion:				Entanglement:	
		one				None	
Stressors to	Air Quality:		Sediments and	Wat	er Quality:		
Physical	Criteria air pollutants		None				
Resources	· ·						
Stressors to	Cultural Resources:	Socioed	onomic Resources	s:	Public	Health and Safety:	
Human Resources	Physical disturbance and	Accessil	oility		Physic	al interactions	
	strike		disturbance and s	trike			
		Airborn	e acoustics				
Military	Ingestible Material:		Military	Nor	ne		
Expended	None		Recoverable				
Material	Non-Ingestible Material:		Material				
	None						
Sonar and Other	None			•			
Transducer Bins							
In-Water	None						
Explosive Bins							
Procedural	None						
Mitigation							
Measures							
Assumptions	Sea-, land-, and air-based a						
Used for Analysis	units may be damaged and	lost. Sm	all expendable unit	ts ma	y also be us	sed.	

A.1.4 ANTI-SUBMARINE WARFARE TRAINING

Anti-submarine warfare involves helicopter and maritime patrol aircraft, ships, and submarines. These units operate alone or in combination to locate, track, and neutralize submarines. Controlling the undersea battlespace is a unique naval capability and a vital aspect of sea control. Undersea battlespace dominance requires proficiency in anti-submarine warfare. Every deploying strike group and individual surface combatant must possess this capability.

Various types of active and passive sonar are used by the Navy to determine water depth, and identify, track, and target submarines. Passive sonar "listens" for sound waves by using underwater microphones, called hydrophones, which receive, amplify, and process underwater sounds. No sound is introduced into the water when using passive sonar. Passive sonar can indicate the presence, character, and movement of submarines. However, passive sonar provides only a bearing (direction) to a sound-emitting source; it does not provide an accurate range (distance) to the source. Active sonar is needed to locate objects because active sonar provides both bearing and range to the detected contact (such as an enemy submarine).

The Navy's anti-submarine warfare training plan, including the use of active sonar in at-sea training scenarios, includes multiple levels of training. Individual-level anti-submarine warfare training addresses basic skills such as detection and classification of contacts, distinguishing discrete acoustic signatures including those of ships, submarines, and marine life, and identifying the characteristics, functions, and effects of controlled jamming and evasion devices.

More advanced, integrated anti-submarine warfare training exercises involving active sonar are conducted in coordinated, at-sea operations during training events involving submarines, ships, aircraft, and helicopters. This training integrates the full anti-submarine warfare continuum from detecting and tracking a submarine to attacking a target using either exercise torpedoes or simulated weapons. Training events include detection and tracking exercises against "enemy" submarine contacts; torpedo employment exercises against the target; and exercising command and control tasks in a multi-dimensional battlespace.

A.1.4.1 Torpedo Exercise – Helicopter

Anti-Submarin	e Warfare							
Anti-Submarin	e Warfare Torpedo Exercise -	- Helicopter (TORPEX)						
Short	Helicopter crews search for		Typical Duration					
Description	submarines. Recoverable ai are employed against subm	r launched torpedoes	2–5 hours					
Long Description	simulated threat submarine launch a torpedo and destrunderwater tracking range. helicopter operating at altitis employed from an altitudithe sonobuoy search. The a Expendable Mobile Anti-sul submarine. This exercise mexercise involving multiple systems, such as the MQ-8 special recovery helicopter instrumented underwater researched.	using sonobuoys and dipping sonar search for, detect, classify, localize, and track a preat submarine with the goal of determining a firing solution that could be used to repedo and destroy the submarine. The exercise may be conducted on a portable tracking range. Sonobuoys (both passive and active) are typically employed by a operating at altitudes below 3,000 feet (ft.). Dipping sonar (both passive and active) I from an altitude of about 50 ft. after the search area has been narrowed based on by search. The anti-submarine warfare target used for this exercise may be a MK-39 Mobile Anti-submarine Warfare Training Target, a MK-30 target, or a live This exercise may involve a single aircraft, or occur during a coordinated larger olving multiple aircraft and ships, including a major range event. Unmanned aerial ch as the MQ-8 Fire Scout, may also be used. The exercise torpedo is recovered by a very helicopter or small craft. The preferred range for this exercise is an end underwater range, but it may be conducted anywhere within the Study Area on training requirements and available assets.						
Typical Components	Platforms: Rotary-wing airc boats Targets: Sub-surface target Systems being Trained/Tes	S	system - rotary wing, surface vessels, small nar, torpedoes					
Standard	Vessel safety	Typical Locations						
Operating Procedures (Section 2.3.3)	Aircraft safety Unmanned aerial and underwater vehicle procedures Target deployment and retrieval safety	Range Complexes, Ranges: Mariana Islands Tr Testing Study Area	None raining and					
Stressors to	Acoustic:	Physical Disturbance	and Strike: Energy:					
Biological Resources	Sonar and other transducers Aircraft noise Vessel noise Explosive: None	Aircraft and aerial tary Vessels and in-water of Military expended ma Ingestion: Military expended ma munitions Military expended ma than munitions	get In-air electromagnetic devices devices Entanglement: Decelerators/parachutes eterials Wires and cables					
Stressors to	Air Quality:		nts and Water Quality:					
Physical Resources	Criteria air pollutants	Chemica Metals						
Stressors to Human Resources	Cultural Resources: Physical disturbance and strike	Socioeconomic Res Accessibility Airborne acoustics Physical disturbanc	Public Health and Safety: Underwater energy Physical interactions					

Anti-Submarin	Anti-Submarine Warfare					
Anti-Submarin	e Warfare Torpedo Exercise – Helicopter	(TORPEX)				
Military	Ingestible Material:	Military	Lightweight torpedo (non-explosive),			
Expended	Decelerators/parachutes - small	Recoverable	sub-surface target (mobile)			
Material	Non-Ingestible Material: Expended bathythermograph, expended bathythermograph wire, expendable transponder anchors, lightweight torpedo accessories, sonobuoy (non-explosive), sonobuoy wires, sub-surface target (mobile)	Material				
Sonar and Other	Mid-Frequency: Torpedo MF4 MF5 TORP1	es:				
Transducer Bins	WIF4 WIF5 TORPI					
Explosive Bins	None					
Procedural Mitigation Measures	Acoustic Stressors: (Section 5.3.2) Active sonar	(Se	al Disturbance and Strike Stressors: ction 5.3.4) movement			
Assumptions Used for Analysis	This activity occurs greater than 3 NM fr Submarine may provide service as the ta					

A.1.4.2 Torpedo Exercise – Maritime Patrol Aircraft

Anti-Submarin	Anti-Submarine Warfare							
	e Warfare Torpedo Exercise	– Maritime Patrol Aircra	ft (TORPEX)					
Short	Maritime patrol aircraft cre	ews search for, track,	Typical Duration					
Description	and detect submarines. Re							
	launched torpedoes are en	nployed against	2–8 hours					
	submarine targets.							
Long Description	Fixed-wing maritime patrol aircraft employ sonobuoys to search for, detect, classify, localize, and track a simulated threat submarine with the goal of determining a firing solution that could be used to launch a torpedo and destroy the submarine. The exercise may be conducted on a portable underwater tracking range. Sonobuoys (both passive and active) are typically employed by a maritime patrol aircraft operating at altitudes below 3,000 feet. However, sonobuoys may be released at higher altitudes. Sonobuoys are deployed in specific patterns based on the expected threat submarine and specific water conditions. Depending on these two factors, these patterns will cover many							
	different size areas. For certain sonobuoys, tactical parameters of use may be classified. The anti-submarine warfare target used for this exercise may be a MK-39 Expendable Mobile Anti-Submarine Warfare Training Target, a MK-30 target, or a live submarine. This exercise may involve a single aircraft, or be undertaken in the context of a coordinated larger exercise involving multiple aircraft and vessels, including a major range event. The exercise torpedo is recovered by helicopter or small craft. The preferred range for this exercise is an instrumented underwater range, but it may be conducted anywhere within the Study Area depending on training requirements and available assets.							
Typical	Platforms: Fixed-wing aircr	raft						
Components	Targets: Sub-surface targe	ts						
	Systems being Trained/Te	sted: Mid-frequency sona	ar, torpedoes					
Standard	Aircraft safety	Typical Locations						
Operating	Target deployment and	Range Complexes/Test	ing Bays/Estuaries/Pierside:					
Procedures (Section	retrieval safety	Ranges:	None					
(Section 2.3.3)		Mariana Islands Trainin	g and					
2.3.3)		Testing Study Area						
Stressors to	Acoustic:	Physical Disturbance a						
Biological	Sonar and other	Aircraft and aerial targe						
Resources	transducers	Military expended mat						
	Aircraft noise	Vessels and in-water de	Entanglement:					
	Explosive:	Ingestion:	Decelerators/parachutes					
	None	Military expended mate munitions						
		Military expended mat	erials – other					
-		than munitions						
Stressors to	Air Quality:		ts and Water Quality:					
Physical Resources	Criteria air pollutants	Chemicals Metals	s Other materials					
Stressors to	Cultural Resources:	Socioeconomic Reso						
Stressors to Human	Physical disturbance and	Accessibility	ources: Public Health and Safety: Underwater energy					
Resources	strike	Accessibility Airborne acoustics	Physical interactions					
resources	JUINC							
	Physical disturbance and strike							

	Anti-Submarine Warfare					
Anti-Submarine Warfare Torpedo Exercise – Maritime Patrol Aircraft (TORPEX)						
Ingestible Material:	Military	Lightweight torpedo (non-explosive),				
Decelerators/parachutes - small		sub-surface target (mobile)				
Non-Ingestible Material:	iviateriai					
wires, sub-surface target (mobile)						
Mid-Fred	quency:	Torpedoes:				
MF5		TORP1				
None						
None						
Acoustic Stressors: (Section 5.3.2)						
Active sonar						
	<u>.</u>					
· ·	•					
	_					
	Ingestible Material: Decelerators/parachutes - small Non-Ingestible Material: Expended bathythermograph, expended bathythermograph wire, lightweight torpedo accessories, sonobuoy (non-explosive), sonobuoy wires, sub-surface target (mobile) Mid-Free MF5 None Acoustic Stressors: (Section 5.3.2) Active sonar Submarine may provide service as the ta If target is air-dropped, one parachute po	Ingestible Material: Decelerators/parachutes - small Non-Ingestible Material: Expended bathythermograph, expended bathythermograph wire, lightweight torpedo accessories, sonobuoy (non-explosive), sonobuoy wires, sub-surface target (mobile) Mid-Frequency: MF5 None Acoustic Stressors: (Section 5.3.2)				

A.1.4.3 Torpedo Exercise – Submarine

Anti-Submarin	e Warfare					
Anti-Submarin	e Warfare Torpedo Exercise	– Submarine	(TORPEX)			
Short	Submarine crews search fo	r, track, and	detect	Турі	ical Duration	
Description	submarines. Exercise torpe this event.			8 ho		
Long Description	Submarine crews search for, detect and track a threat submarine to develop firing position to launch a torpedo. A single submerged submarine operates at slow speeds and various depths while using its hull mounted or towed array sonar to track a threat submarine. While passive sonar is most typically used for this training event, some active sonar may be used on occasion. Non-explosive exercise torpedoes may also be fired during training.					
	This exercise may involve a single submarine, or be undertaken in the context of a coordinated larger exercise involving multiple aircraft, ships, and submarines, including a major range event. The exercise torpedo is recovered by helicopter or small craft. The preferred range for this exercise is an instrumented underwater range, but it may be conducted anywhere within the Study Area depending on training requirements and available assets.					
Typical	Platforms: Submarines, sup	pport boat, s	upport airc	raft		
Components	Targets: Sub-surface target Systems being Trained/Te		equency and	d high	n-frequency sonar, torpedoes	
Standard	Vessel safety	Typical Locations				
Operating	Aircraft safety	Page Compleyer / Testing Page / Estudies / Diagrida				
Procedures	Target deployment and	Range Complexes/Testing Bays/Estuaries/Pierside: Ranges: None				
(Section	retrieval safety	Ranges: None Mariana Islands Training and				
2.3.3)		Testing Stu		ing and	u	
Stressors to Biological Resources	Acoustic: Sonar and other transducers Vessel noise Explosive:	Physical Disturbance and Strike: Vessels and in-water devices Military expended materials Ingestion: Military expended materials — other Energy: None Entanglement: Wires and cables			es None Entanglement: Wires and cables	
	None	than mu				
Stressors to Physical Resources	Air Quality: None		Sedimen Metals	its and	d Water Quality:	
Stressors to	Cultural Resources:		onomic Res			
Human Resources	Physical disturbance and strike	Physical	disturbance	e and	strike Underwater energy Physical interactions	
Military Expended Material	Ingestible Material: None Non-Ingestible Material: Acoustic countermeasures, bathythermograph, expend bathythermograph wire, gu wire, heavyweight torpedo	led iidance	Military Recovera Material	ible	Heavyweight (non-explosive) torpedo, sub-surface target (mobile)	
Sonar and	Anti-Submarine Warfare:	-	equency:		Mid-Frequency:	
Other Transducer Bins	ASW4 Torpedoes: TORP2	HF1			MF3	

Anti-Submarin	Anti-Submarine Warfare						
Anti-Submarin	Anti-Submarine Warfare Torpedo Exercise – Submarine (TORPEX)						
Explosive	None						
Bins							
Procedural	Acoustic Stressors: (Section 5.3.2)	Physical Disturbance and Strike Stressors:					
Mitigation	Active sonar	(Section 5.3.4)					
Measures		Vessel movement					
Assumptions	Torpedoes are recovered.						
Used for	Guidance wire has a low breaking strength and breaks easily. Weights and flex tubing sink						
Analysis	rapidly.						
	This activity occurs greater than 3 NM fro	m land.					

A.1.4.4 Torpedo Exercise – Surface

Anti-Submarin	e Warfare						
Anti-Submarin	e Warfare Torpedo Exercise	Surface (TC	RPEX)				
Short	Surface ship crews search t			Typical Dura	tion		
Description	submarines. Exercise torpe	edoes are use	d during	2–5 hours			
	this event.						
Long Description	Surface ships search for, de				- :		
Description	to launch a torpedo and att portable underwater tracki			-			
	employing hull mounted or		•	•	•		
	depending on the type of the	-					
	conditions. The anti-subma						
	Mobile Anti-Submarine Wa	arfare (ASW) Training Target, MK-30 Target, or live submarine.					
	This exercise may involve a	a single ship, or be undertaken in the context of a coordinated					
	larger exercise involving mu	ultiple aircraf	t, ships, and	submarines,	including a major		
	range event.						
	The exercise torpedo is rec	overed by hel	licopter or s	mall craft. Th	e preferred area for this		
			•	•	ducted anywhere within the		
		training requirements and available assets.					
Typical	Platforms: Surface combat						
Components	Targets: Sub-surface target	_					
Standard	Towed in-water device	ested: Mid-frequency sonar, torpedoes Typical Locations					
Operating	safety						
Procedures	Vessel safety	_	plexes/Test	ing	Bays/Estuaries/Pierside:		
(Section	Target deployment and	Ranges:	ands Trainin	a and	None		
2.3.3)	retrieval safety	Testing Stu		ganu			
Stressors to	Acoustic:	•	sturbance a	nd Strike:	Energy:		
Biological	Sonar and other	-	d in-water de		In-air electromagnetic		
Resources	transducers	Military exp	pended mat	erials	devices		
	Vessel noise	Ingestion:			Entanglement:		
	Explosive:	_	pended mat	erials – other	_		
	None	than mu	ınitions		Wires and cables		
Stressors to	Air Quality:			s and Water	Quality:		
Physical	Criteria air pollutants		Metals				
Resources Stressors to	Cultural Resources:	Sociooso	nomic Reso		Dublic Health and Safatur		
Human	Physical disturbance and	Accessibi		urces.	Public Health and Safety: Underwater energy		
Resources	strike		acoustics		Physical interactions		
		Physical	disturbance	and strike	•		
Military	Ingestible Material:		Military		eight torpedo (non-explosive),		
Expended	Decelerators/parachutes -	small	Recoverab	sub-sui	rface target (mobile)		
Material	Non-Ingestible Material:		Material				
	Expended bathythermogra	-					
	expended bathythermogra	-					
	lightweight torpedo access						
	sonobuoy (non-explosive), wires	νουασοίος					
	wiies						

Anti-Submarine Warfare								
Anti-Submarin	Anti-Submarine Warfare Torpedo Exercise – Surface (TORPEX)							
Sonar and	Anti-Submarine Warfare:	Mid-Fre	quency:	Torpedoes:				
Other	ASW3	MF1	MF5	5 TORP1				
Transducer								
Bins								
Explosive	None			•				
Bins								
Procedural	Acoustic Stressors: (Section 5	5.3.2)	,	Physical Disturbance and Strike Stressor	s:			
Mitigation	Active sonar			(Section 5.3.4)				
Measures				Vessel movement				
				Towed In-water devices				
Assumptions	Submarines may provide serv	ice as the t	arget. To	orpedoes are recovered.				
Used for	This activity occurs greater th	an 3 NM fr	om land.					
Analysis								

A.1.4.5 Tracking Exercise – Helicopter

Anti-Submarin	e Warfare						
	e Warfare Tracking Exercise	– Helicop	ter (TRACKEX)				
Short	Helicopter crews search for	r, track, a	nd detect	Typical Du	ration		
Description	submarines.			2–4 hours			
Long Description	Helicopters using sonobuoys and dipping sonar search for, detect, classify, localize, and track a simulated threat submarine with the goal of determining a firing solution that could be used to launch a torpedo and destroy the submarine. Sonobuoys (both passive and active) are typically employed by a helicopter operating at altitudes below 3,000 ft. Dipping sonar (both passive and active) is employed from an altitude of about 50 ft. after the search area has been narrowed based on the sonobuoy search.						
	The anti-submarine warfare target used for this exercise may be a MK-39 Expendable Mobile Anti-submarine Warfare Training Target, a MK-30 target, or a live submarine. This exercise may involve a single aircraft, or occur during a coordinated larger exercise involving multiple aircraft and ships, including a major range event. Unmanned aerial systems, such as the MQ-8 Fire Scout, may also be used. The preferred range for this exercise is an instrumented range, but it may be conducted anywhere within the Study Area depending on training requirements and available assets.						
Typical Components	Platforms: Rotary-wing aird Targets: Sub-surface target						
	Systems being Trained/Tes	sted: Mid	Frequency Soi	nar (sonobud	oys, dipping sonar)		
Standard	Aircraft safety		Typical Locat	ions			
Operating Procedures (Section 2.3.3)			Range Compl Ranges: Mariana Islar Testing Study Transit Corrid	nds Training Area	None		
Stressors to	Acoustic:	Physica	l Disturbance	and Strike:	Energy:		
Biological Resources	Sonar and other transducers	Aircraft Vessels	and aerial targ and in-water o	get Ievices	In-air electromagnetic devices		
	Aircraft noise Explosive: None	Ingestic	expended ma	teriais	Entanglement: Decelerators/parachutes Wires and cables		
			expended ma munitions	terials – oth	er		
Stressors to Physical	Air Quality: Criteria air pollutants		Chemica	_	•		
Resources		-	Metals		Other materials		
Stressors to Human Resources	Cultural Resources: Physical disturbance and strike	Acces Airbo	economic Res ssibility orne acoustics cal disturbance		Public Health and Safety: Underwater energy Physical interactions		

Anti-Submarin	Anti-Submarine Warfare					
Anti-Submarin	Anti-Submarine Warfare Tracking Exercise – Helicopter (TRACKEX)					
Military	Ingestible Material:	Military	None			
Expended	Decelerators/parachutes - small	Recoverable				
Material	Non-Ingestible Material: Expended bathythermograph, expended bathythermograph wire, sonobuoy (non-explosive), sonobuoy wires, sub-surface target (mobile)	Material				
Sonar and Other	Mid-Frequency: MF4 MF5					
Transducer	1011 4 1011 3					
Bins						
Explosive	None					
Bins						
Procedural	Acoustic Stressors: (Section 5.3.2)					
Mitigation	Active sonar					
Measures						
Assumptions	Submarines may provide service as the t	•				
Used for	This activity occurs greater than 3 NM fr	om land.				
Analysis						

A.1.4.6 Tracking Exercise – Maritime Patrol Aircraft

Anti-Submarine Warfare Anti-Submarine Warfare Tracking Exercise – Maritime Patrol Aircraft (TRACKEX)					
I Anti-Supmarine warrare Tracking Exercise – Maritime Patrol Aircraft (TRACKEX)					
Short Maritime patrol aircraft crews search for, track, Typical Duration					
Description and detect submarines. 12–8 hours					
Long Fixed-wing maritime patrol aircraft employ sonobuoys to search for, detect, class	sifv				
Description localize, and track a simulated threat submarine with the goal of determining a fi	• •				
solution that could be used to launch a torpedo and destroy the submarine.	6				
Sonobuoys (both passive and active) are typically employed by a maritime patrol					
operating at altitudes below 3,000 feet. However, sonobuoys may be released at altitudes. Sonobuoys are deployed in specific patterns based on the expected thr	-				
and specific water conditions. Depending on these two factors, these patterns wi					
different size areas. For certain sonobuoys, tactical parameters of use may be cla	-				
anti-submarine warfare target used for this exercise may be a MK-39 Expendable					
Submarine Warfare (ASW) Training Target, a MK-30 target, or a live submarine. T					
may involve a single aircraft, or be undertaken in the context of a coordinated lar					
involving multiple aircraft and vessels, including a major range event.	_				
Typical Platforms: Fixed-wing aircraft					
Components Targets: Sub-surface targets					
Systems being Trained/Tested: Mid-frequency sonar					
Standard Aircraft safety Typical Locations					
Operating Target Deployment and Range Complexes/Testing Bays/Estuaries	s/Pierside·				
Panges: None	5) 1 ICI 5IGC.				
(Section Mariana Islands Training and	Mariana Islands Training and				
2.3.3) Testing Study Area	_				
Stressors to Acoustic: Physical Disturbance and Strike: Energy:					
Biological Sonar and other Aircraft and aerial target In-air electr	romagnetic				
Resources transducers Vessels and in-water devices devices	romagnetic				
Resources transducers Vessels and in-water devices devices Aircraft poise Military expended materials	_				
Resources transducers Vessels and in-water devices devices Aircraft noise Military expended materials Entanglement	_				
Resources transducers Vessels and in-water devices devices Aircraft noise Military expended materials Entanglement	ent: rs/parachutes				
Resources transducers Vessels and in-water devices devices Aircraft noise Military expended materials Entangleme Explosive: Ingestion: Decelerator None Military expended materials – other	ent: rs/parachutes				
Resources transducers Vessels and in-water devices devices Aircraft noise Military expended materials Entangleme Explosive: Ingestion: Decelerator None Military expended materials – other than munitions	ent: rs/parachutes				
Resources transducers Aircraft noise Military expended materials Entangleme Explosive: None Military expended materials — Obecelerator Wires and of Military expended materials — other than munitions Stressors to Air Quality: Sediments and Water Quality:	ent: rs/parachutes				
Resources transducers Aircraft noise Military expended materials Entangleme Explosive: None Military expended materials Decelerator Wires and complete than munitions Stressors to Physical Transducers Military expended materials Military expended materials – other than munitions Sediments and Water Quality: Chemicals	ent: rs/parachutes				
Resources transducers Aircraft noise Military expended materials Entangleme Explosive: None Military expended materials Ingestion: Military expended materials — Other than munitions Stressors to Physical Resources Transducers Military expended materials Military expended materials — other than munitions Sediments and Water Quality: Chemicals Metals Other materials	ent: rs/parachutes cables				
Resources transducers Aircraft noise Explosive: None Military expended materials Entangleme Explosive: None Military expended materials Military expended materials — other than munitions Stressors to Physical Resources Air Quality: Criteria air pollutants Resources Stressors to Cultural Resources: Socioeconomic Resources: Public Health a	ent: rs/parachutes cables and Safety:				
Resources transducers Aircraft noise Explosive: None Military expended materials Entangleme Ingestion: None Military expended materials — other than munitions Stressors to Physical Resources Air Quality: Criteria air pollutants Chemicals Metals Other materials Stressors to Human Physical disturbance and Accessibility Vessels and in-water devices Military expended materials Entangleme Ingestion: Sediments Sediments and Water Quality: Chemicals Metals Other materials Other materials Other materials Other materials	ent: rs/parachutes cables and Safety: nergy				
Resources transducers Aircraft noise Explosive: None Military expended materials Entangleme Explosive: None Military expended materials Military expended materials — other than munitions Stressors to Physical Resources Air Quality: Criteria air pollutants Resources Stressors to Cultural Resources: Socioeconomic Resources: Public Health a	ent: rs/parachutes cables and Safety: nergy				
Resources transducers Aircraft noise Aircraft noise Explosive: None Military expended materials Entangleme Wires and or Military expended materials — other than munitions Stressors to Physical Resources Stressors to Human Resources Physical disturbance and Resources Strike Air Quality: Criteria air pollutants Chemicals Metals Other materials Accessibility Airborne acoustics Physical disturbance and strike Airborne acoustics Physical intera	ent: rs/parachutes cables and Safety: nergy actions				
Resources transducers Aircraft noise Aircraft noise Explosive: None Military expended materials Entangleme Wires and or Military expended materials — other than munitions Stressors to Physical Resources Stressors to Human Resources Physical disturbance and Resources Strike Air Quality: Criteria air pollutants Chemicals Metals Other materials Accessibility Airborne acoustics Physical disturbance and strike Airborne acoustics Physical intera	ent: rs/parachutes cables and Safety: nergy actions				
Resourcestransducers Aircraft noiseVessels and in-water devices Military expended materialsdevicesExplosive: NoneIngestion: Military expended materials – other than munitionsDecelerator Wires and or Military expended materials – other than munitionsStressors to Physical ResourcesAir Quality: Criteria air pollutantsSediments and Water Quality: Chemicals MetalsStressors to Human ResourcesCultural Resources: Physical disturbance and strikeSocioeconomic Resources: Airborne acoustics Physical disturbance and strikeMilitary ExpendedIngestible Material: Decelerators/parachutes - smallMilitary 	ent: rs/parachutes cables and Safety: nergy actions				
Resources transducers Aircraft noise Aircraft noise Explosive: None Military expended materials Ingestion: None Military expended materials — other than munitions Stressors to Physical Resources Criteria air pollutants Criteria air pollutants Chemicals Metals Other materials Stressors to Human Resources Physical disturbance and strike Military Ingestible Material: Military Non-Ingestible Material: Non-Ingestible Material: Military expended materials Entangleme Decelerator Noilitary expended materials Entangleme Noilitary expended materials Sediments and Water Quality: Chemicals Metals Other materials Other materials Accessibility Underwater expended in the strike of the strike o	ent: rs/parachutes cables and Safety: nergy actions				
Resources transducers Aircraft noise Aircraft noise Explosive: None Military expended materials Entangleme Explosive: None Military expended materials — Decelerator Wires and or Military expended materials — other than munitions Stressors to Physical Resources Criteria air pollutants Chemicals Metals Other materials Stressors to Human Resources Physical disturbance and Resources Airborne acoustics Physical disturbance and strike Military Expended Material Non-Ingestible Material: Expended bathythermograph, Military Expended bathythermograph,	ent: rs/parachutes cables and Safety: nergy actions				
Resources transducers Aircraft noise Aircraft noise Explosive: None Military expended materials Ingestion: None Military expended materials — other than munitions Stressors to Physical Resources Criteria air pollutants Criteria air pollutants Chemicals Metals Other materials Stressors to Human Resources Physical disturbance and strike Military Ingestible Material: Military Non-Ingestible Material: Non-Ingestible Material: Military expended materials Entangleme Decelerator Noilitary expended materials Entangleme Noilitary expended materials Sediments and Water Quality: Chemicals Metals Other materials Other materials Accessibility Underwater expended in the strike of the strike o	ent: rs/parachutes cables and Safety: nergy actions				

Anti-Submarin	Anti-Submarine Warfare			
Anti-Submarin	Anti-Submarine Warfare Tracking Exercise – Maritime Patrol Aircraft (TRACKEX)			
Sonar and	Mid-Frequency:			
Other	MF5			
Transducer				
Bins				
Explosive	None			
Bins				
Procedural	Acoustic Stressors: (Section 5.3.2)			
Mitigation	Active sonar			
Measures				
Assumptions	Submarine may provide service as the target.			
Used for	If target is air-dropped, one parachute per target.			
Analysis	This activity occurs greater than 3 NM from land.			

A.1.4.7 Tracking Exercise – Submarine

Anti-Submarine Warfare Anti-Submarine Warfare Tracking Exercise – Submarine (TRACKEX) Short Description Submarine crews search for, track, and detect submarines. Long Description Submarine crews search for, detect and track a threat submarine to launch a torpedo. A single submarine operates at slow speeds and various				
Short Description Submarine crews search for, track, and detect submarines. Typical Duration 8 hours Long Description Submarine crews search for, detect and track a threat submarine to launch a torpedo.				
Descriptionsubmarines.8 hoursLong DescriptionSubmarine crews search for, detect and track a threat submarine to launch a torpedo.				
Description launch a torpedo.	develop firing position to			
Description launch a torpedo.				
A single submerged submarine operates at slow speeds and various				
A single submerged submarine operates at slow speeds and various	البيط مغنون مانطين مطغوماه			
mounted or towed array sonar to track a threat submarine. Passive	-			
exclusively. The target for this exercise is either an MK 39 expendab				
warfare training target, MK 30 recoverable training target, or live su				
This exercise could occur anywhere throughout the MITT Study Area				
a single submarine, or be undertaken in the context of a coordinated multiple aircraft, ships, and submarines, including a major range even				
Typical Platforms: Submarines				
Components Targets: Sub-surface targets				
Systems being Trained/Tested: Mid-frequency and high-frequency	sonar			
Standard Vessel safety Typical Locations				
Operating Target Deployment and	ava /Faturaria a /Diamaida			
Procedures Retrieval Safety	ays/Estuaries/Pierside: one			
(Section Mariana Islands Training and	one			
2.3.3) Testing Study Area				
Transit Corridor				
Stressors to Acoustic: Physical Disturbance and Strike:	Energy:			
Biological Sonar and other Vessel and in-water devices	None			
Resources transducers Military expended materials	Entanglement:			
Vessel noise Ingestion:	Wires and cables			
Explosive: None				
None				
Stressors to Air Quality: Sediments and Water Qu	ality:			
Physical None Metals				
Resources				
	ublic Health and Safety:			
	nderwater energy			
	hysical interactions ce target (mobile)			
MilitaryIngestible Material:MilitarySub-surfarExpendedNoneRecoverable	ce target (mobile)			
Material				
Non-Ingestible Material:				
Acoustic countermeasures, expended bathythermograph, expended				
bathythermograph wire				
	lid-Frequency:			
	1F3			
Transducer				
Bins				
Explosive None				
Bins				

Anti-Submarin	Anti-Submarine Warfare				
Anti-Submarin	Anti-Submarine Warfare Tracking Exercise – Submarine (TRACKEX)				
Procedural	Acoustic Stressors: (Section 5.3.2)				
Mitigation	Active sonar				
Measures					
Assumptions	This activity occurs greater than 3 NM from land.				
Used for					
Analysis					

A.1.4.8 Tracking Exercise – Surface

Anti-Submarin	e Warfare						
	e Warfare Tracking Exercise	- Surface (TRACI	KEX)				
Short	Surface ship crews search f			ypical Dura	tion		
Description	submarines.	2–4 ho					
Long	Surface ships search for, de	, detect, and track threat submarines to determine a firing position					
Description	to launch a torpedo and att		_ ·				
	towed array sonar. Passive submarine, the tactical situ is either a MK-39 Expendab Recoverable Training Targe Anti-Submarine Warfare (A MITT Study Area. This exerc	slow speeds while employing sonobuoys, hull mounted sonar, or or active sonar is employed depending on the type of threat ation, and environmental conditions. The target for this exercise ble Mobile Anti-Submarine Warfare Training Target, MK-30 t, or live submarine. SW) Tracking exercise – Ship could occur anywhere throughout the cise may involve a single ship, or be undertaken in the context of a					
	_	e involving multip	ile aircraft	, snips, and	submarines, including a major		
Typical Components	range event. Platforms: Surface combata Targets: Sub-surface target Systems being Trained/Tes	:s	ncy sonar				
Standard	Vessel safety	Typical Locatio	ns				
Operating Procedures (Section 2.3.3)	Towed in-water device safety Target deployment and retrieval safety	Range Complexes/Testing Ranges: Mariana Islands Training and Testing Study Area			Bays/Estuaries/Pierside: None		
Stressors to Biological Resources	Acoustic: Sonar and other transducers Vessel noise Explosive: None	Transit Corridor Physical Disturbance and Strike: Vessels and in-water devices Military Expended Materials Ingestion: None			Energy: In-air electromagnetic devices In-water electromagnetic devices Entanglement: Wires and cables		
Stressors to	Air Quality:	S	ediments	and Water			
Physical Resources	Criteria air pollutants		lone	una vvater	Quality.		
Stressors to Human Resources	Cultural Resources: Physical disturbance and strike	Socioeconomic Resources: Accessibility Airborne acoustics Physical disturbance and strike Public Health and Safe Underwater energy Physical interactions					
Military Expended Material	Ingestible Material: None Non-Ingestible Material: Buoy (non-explosive), expended bathythermograph, expended bathythermograph wire, sutarget (mobile)	Re M	ilitary ecoverablo aterial		rface target (mobile)		

Anti-Submarin	Anti-Submarine Warfare					
Anti-Submarin	e Warfare Tracking Exercise – S	Surface (TR	ACKEX)			
Sonar and	Anti-Submarine Warfare:	Mid-Free	quency:			
Other	ASW1 ASW3	MF1	MF11			
Transducer		MF12				
Bins						
Explosive	None	•	•			
Bins						
Procedural	Acoustic Stressors: (Section 5	.3.2)	Physical Disturbance and Strike Stressors:			
Mitigation	Active sonar		(Section 5.3.4)			
Measures			Vessel movement			
			Towed in-water devices			
Assumptions	A submarine may provide service as the target.					
Used for	This activity occurs greater th	an 3 NM fro	om land.			
Analysis	_					

A.1.4.9 Surface Warfare Advanced Tactical Training

nall Integrated Anti-Submarine Warfare Training						
rface Warfare Advanced Tactical Training						
ort Multiple ships and aircraft coordinate the use of Typical Duration						
secription sensors, including sonobuoys, to search, detect,						
and track a threat submarine. Surface Warfare						
Advanced Tactical Training exercises are not Up to 15 days						
dedicated Anti-Submarine Warfare events and						
involve multiple warfare areas.						
ng Surface Warfare Advanced Tactical Training (SWATT) is an intermediate training exercise						
designed primarily to increase operator proficiency and exercise combined force responses	to					
surface warfare, anti-submarine warfare, air warfare and electromagnetic spectrum operati	ions.					
Surface Warfare Advanced Tactical Training is conducted after a carrier strike group's first						
Surface Warfare Advanced Tactical Training is conducted after a carrier strike group's first						
Group Sail, and before Composite Training Unit Exercise, and consists of multiple surface warfare, anti-submarine, and air warfare live-fire events. Multiple ships and aircraft search	for					
locate, and track one submarine. Occurs once per carrier strike group training cycle.	101,					
locate, and track one submarine. Occurs once per carrier strike group training cycle.						
All other warfare area training conducted during SWATT was analyzed as unit-level training						
(gunnery, missile exercise, etc.).						
pical Platforms: Multiple Surface Combatants, fixed-wing aircraft, helicopters, unmanned vehicle	s,					
mponents and submarines						
Targets: All surface, air and anti-submarine warfare targets (e.g., MK-30s, MK-39 Expendable	e					
Mobile Training Targets, recoverable or expendable floating targets)						
Systems being Trained/Tested: Mid-frequency sonar, high-frequency sonar, lightweight						
torpedoes, high-frequency acoustic modems						
andard Vessel safety Typical Locations						
Perating Aircraft safety Range Complexes/Testing Bays/Estuaries/Pierside:						
ocedures weapons firing safety Panges: None						
Towed in-water device Hawaii Range Complex						
3.3) safety Southern California Range						
Complex						
ressors to Acoustic: Physical Disturbance and Strike: Energy:						
Dological Sonar and other Aircraft and aerial targets In-air electromagnetic						
sources transducers Vessels and in-water devices devices						
Aircraft noise Military expended materials						
Vessel noise Entanglement:						
Weapons noise Ingestion: Wires and cables						
Military expended materials – Decelerators/parachut	es					
Explosive: munitions						
In-air explosions Military expended materials – other						
than munitions						
ressors to Air Quality: Sediments and Water Quality:						
ysical Criteria air pollutants Explosives Chemicals						
sources Habitats: Metals						
Physical disturbance and strike –						
military expended material						
	:					
ressors to Cultural Resources: Socioeconomic Resources: Public Health and Safety:						
ressors to Cultural Resources: Socioeconomic Resources: Public Health and Safety:						

Small Integrated Anti-Submarine Warfare Training						
	re Advanced Tactical Training					
Military Expended Material	Ingestible Material: Target fragments, small-caliber projectiles, small decelerators/parachutes Non-Ingestible Material: Sonobuoys, large and medium-calib projectiles, acoustic countermeasures	Military Recoverable Material	Anti-submarine warfare targets Air warfare targets Surface warfare targets			
Sonar and Other Transducer Bins	Mid-Frequency: Ant MF1 ASV MF1K ASV MF3 ASV MF4 Tor MF5 TOR MF6 TOR	/3 /4 pedoes:	re:			
Explosive Bins	None					
Procedural Mitigation Measures	Acoustic Stressors: (Section 5.3.2) Active sonar Physical Disturbance and Strike: (Section 5.3.4) Vessel movement Towed in-water devices					
Assumptions Used for Analysis	Towed in-water devices All other warfare area training conducted during SWATT was analyzed as unit-level training (gunnery, missile exercise, etc.). All military expended materials, munitions, explosives and sonar use is included in individual unit-level events. Additional activities utilizing sources not listed in the Sonar and Other Transducer Bins section above may occur during this exercise. All acoustic sources which may be used during training and testing activities have been accounted for in the modeling and analysis presented in this EIS/OEIS.					

A.1.4.10 Small Joint Coordinated ASW exercise (Multi-Sail/GUAMEX)

Anti-Submarin	e Warfare						
	ordinated ASW Exercise (Mu	lti-Sail/GUAN	ΛΕΧ)				
Short	Typically a 5-day exercise v			Typic	al Dura	tion	
Description	aircraft and submarines int	-	-	71			
	their sensors, including sor	nobuoys, to search, 5 days					
	detect, and track threat su						
Long	This is an Anti-Submarine V	Varfare (ASW) exercise conducted by the forward deployed Navy					
Description	Strike Groups to sustain an		-				
	area of operations. The exe	_					
	in the most realistic enviro	_			-		
	changes to both training ar composition) of U.S. Navy S	-		-		_	
	training value in ASW and o	-				=	
	Additional unit-level activit				_		
Typical	Platforms: Fixed-wing aircr						
Components	Targets: Surface targets, su	-	_		*		
	Systems being Trained/Te	sted: Mid-fre	quency Sor	nar			
Standard	Aircraft safety	Typical Loca	ations				
Operating	Towed in-water device	Range Com	plexes/Tes	ting	-	Bays/Estuaries/Piersi	ide:
Procedures	safety	Ranges:	J			None	
(Section 2.3.3)	Vessel safety	Mariana Isla	ands Traini	ng and			
2.3.3)		Testing Stud	dy Area				
Stressors to	Acoustic:	Physical Di			rike:	Energy:	
Biological	Sonar and other	Aircraft and		-		In-air electromagn	etic
Resources	transducers	Vessel and				devices	
	Aircraft noise Vessel noise	Military expended materials Entanglement:					
		Ingestion:				Decelerator/Paracl	hutes
	Explosive:	Military exp		terials	_	Wires and cables	
	None	munitio	_	احتسمه	بر مراجم		
		Military exp than mu		iteriai -	- otner		
Stressors to	Air Quality:	than inc	Sedimen	ts and	Water	Quality:	
Physical	Criteria air pollutants		Metals	its aiiu		er materials	
Resources	Circona an ponatanto		Chemica	ls	•		
Stressors to	Cultural Resources:	Socioeco	nomic Res	ources	5:	Public Health and Saf	ety:
Human	Physical disturbance and	Accessib	ility			Underwater energy	
Resources	strike	-	disturbance	e and s	trike	In-air energy	
		Airborne	acoustics	ı		Physical interactions	
Military	Ingestible Material:	am all	Military	bla	None		
Expended Material	Decelerators/parachutes - s	Sinali	Recovera Material	bie			
iviate iai	Non-Ingestible Material:		iviaterial				
	Acoustic countermeasures,						
	stores and ballast, expende						
	bathythermograph, expend bathythermograph wire, so						
	(non-explosive), sonobuoy	-					
	surface target (mobile)	1111 03, 300					
	saliace target (mosne)						

Anti-Submarin	e Warfare						
Small Joint Cod	Small Joint Coordinated ASW Exercise (Multi-Sail/GUAMEX)						
Sonar and	Anti-Submarine Warfare:	High-Frequency:	Mid-Freq	uency:			
Other	ASW2 ASW3	HF1	MF1	MF3			
Transducer	ASW4		MF4	MF5			
Bins			MF11	MF12			
Explosive	None. Presented in appropris	ate worksheets for un	it-level activities that cou	ld be conducted			
Bins	during this exercise						
Procedural	Acoustic Stressors: (Section S	5.3.2) I	Physical Disturbance and	Strike Stressors:			
Mitigation	Active sonar (Section 5.3.4)						
Measures	Vessel movement						
	Towed in-water devices						
Assumptions	This activity occurs at least 3	NM from land (FDM	excepted).				
Used for	Additional activities utilizing	sources not listed in t	he Sonar and Other Trans	ducer Bins section			
Analysis	above may occur during this	exercise. All acoustic	sources which may be use	ed during training			
	and testing activities have be	en accounted for in the	he modeling and analysis	presented in this			
	EIS.						

A.1.5 ELECTRONIC WARFARE

Electronic warfare is the mission area of naval warfare that aims to control use of the electromagnetic spectrum and to deny its use by an adversary. Typical electronic warfare activities include threat avoidance training, signals analysis for intelligence purposes, and use of airborne and surface electronic jamming devices to defeat tracking systems.

A.1.5.1 Counter Targeting Chaff Exercise – Aircraft

Electronic Warfare						
Counter Target	ting Chaff Exercise – Aircraft					
Short	Fixed-wing aircraft and heli	copter aircre	ws	Турі	cal Dura	tion
Description	deploy chaff to disrupt thre missile guidance radars.	eat targeting and 1–2 hours				
Long Description	Fixed-wing aircraft and heli guidance radars.	copter aircrews deploy chaff to disrupt threat targeting and missile				
	radars or missiles, dispense	licopter aircrews detect electronic targeting signals from threat se chaff, and immediately maneuver to defeat the threat. The chaff and missile and the aircraft clears away from the threat.				
		which deceiv	e enemy ra	adars.	Chaff is	strips cut in various lengths to employed to create a target ctual friendly platform.
Typical Components	Platforms: Fixed-wing aircr Targets: None Systems being Trained/Te		ing aircraft			
Standard	Aircraft safety	Typical Loca	ations			
Operating		Danga Cam	mloves/Tes	**:	-	Paya/Fatuarias/Diagaidas
Procedures		Range Com Ranges:	ipiexes/ i es	ting		Bays/Estuaries/Pierside: None
(Section		Mariana Isl	ands Traini	ng and	1	None
2.3.3)		Testing Stu			-	
Stressors to	Acoustic:	Physical Di		and St	rike:	Energy:
Biological	Aircraft noise	Aircraft and				In-air electromagnetic
Resources	Explosive:	Military ex	pended ma	terials		devices
	None	Ingestion:				Entanglement:
		0				None
		Military ex	pended ma	terials	– other	
		than mu	<u>initions</u>			
Stressors to	Air Quality:		Sedimen			Quality:
Physical Resources	Criteria air pollutants		Other ma	aterial	S	
Stressors to	Cultural Resources:	Socioeconomic Resources: Public Health ar			Public Health and Safety:	
Human	None	Airborne acoustics			Physical interactions	
Resources					·	
Military	Ingestible Material:		Military		None	
Expended	Per chaff: one chaff-air cart	rtridge, one Recoverable				
Material	plastic endcap, chaff fibers		Material			
	Non-Ingestible Material:					
	None					

Electronic War	Electronic Warfare							
Counter Target	Counter Targeting Chaff Exercise – Aircraft							
Sonar and	None							
Other								
Transducer								
Bins								
Explosive	None							
Bins								
Procedural	None							
Mitigation								
Measures								
Assumptions	Chaff is usually expended while conducting other training activities, such as air combat							
Used for	maneuvering. Potential effects are analyzed under this activity.							
Analysis	This activity occurs greater than 12 NM from land.							

A.1.5.2 Counter Targeting Chaff Exercise – Ship

Electronic War	fare									
	ting Chaff Exercise – Ship									
		1								
Short	Surface ship crews deploy	-		Typical Dur	ation					
Description	targeting and missile guida			1–2 hours						
Long Description	Surface ship crews deploy defend against an attack.	chaff to disrupt threat targeting and missile guidance radars to								
		plactronic targeting signals from threat radars or missiles, dispense								
	chaff, and immediately ma	crews detect electronic targeting signals from threat radars or missiles, dispense mediately maneuver to defeat the threat. The chaff cloud deceives the inbound ne vessel clears away from the threat. The typical event duration is approximately half hours.								
	Chaff is a radar reflector material made of thin, narrow, metallic strips cut in various len elicit frequency responses, which deceive enemy radars. Chaff is employed to create a t that will lure enemy radar and weapons system away from the actual friendly platform. Ships may also train with advanced countermeasure systems, such as the MK 53 Decoy Launching System (Nulka).									
Typical	Platforms: Navy Ships									
Components	Targets: None									
	Systems being Trained/Te	sted: None								
Standard	Vessel safety	Typical Loca	tions							
Operating		Range Com	nlexes/Testi	ng	Bays/Estuaries/Pierside:					
Procedures		Ranges:	pickes, resti	"Б	None					
(Section		Mariana Isla	nds Training	and						
2.3.3)		Testing Stud	_	,						
Stressors to	Acoustic:		turbance ar	nd Strike:	Energy:					
Biological	Vessel noise	Vessels and	in-water de	vices	In-air electromagnetic					
Resources	Explosive:	Military exp	ended mate	rials	devices					
	None	Ingestion:			Entanglement:					
					None					
			ended mate	rials – othe	r					
		than mu								
Stressors to	Air Quality:			and Water	Quality:					
Physical	Criteria air pollutants		Other mat	erials						
Resources			-							
Stressors to	Cultural Resources:		nomic Resou	urces:	Public Health and Safety:					
Human	None	Accessibi	lity		Physical interactions					
Resources	lumantible Material	1	NA:I:Aam.	Nana						
Military Expended	Ingestible Material: Chaff-ship fibers		Military Recoverable	None						
Material	·		Material							
Widterial	Non-Ingestible Material:		Waterial							
	Chaff-ship cartridge									
Sonar and	None									
Other										
Transducer										
Bins	.									
Explosive	None									
Bins										

Electronic War	Electronic Warfare						
Counter Target	ting Chaff Exercise – Ship						
Procedural	Physical Disturbance and Strike Stressors: (Section 5.3.4)						
Mitigation	Vessel movement						
Measures							
Assumptions	This activity occurs greater than 12 NM from land.						
Used for							
Analysis							

A.1.5.3 Counter Targeting Flare Exercise – Aircraft

Electronic War	fare								
	ting Flare Exercise - Aircraft								
Short	Fixed-wing aircraft and hel	icopter aircre	ws	Typical Dur	ration				
Description	deploy flares to disrupt thr guidance systems.	•	_	1–2 hours					
Long Description	Fixed-wing aircraft and helicopter aircrews deploy flares to disrupt threat infrared missile guidance systems. Range personnel acting as opposition forces may use pyrotechnics to simulate missile launch.								
	plume, when launched and This exercise trains aircraft infrared sensors or infrared the flares instead of the re	ectronic targeting signals from threat radars or missiles, or a threat missile ched and dispense flares and immediately maneuver to defeat the threat is aircraft personnel in the use of defensive flares designed to confuse or infrared homing missiles, thereby causing the sensor or missile to lock of the real aircraft. Typically an aircraft will expend five flares in an exercise 3,000 feet. Flare exercises are often conducted with chaff exercises, rand-alone exercise.							
Typical	Platforms: Fixed-wing aircr	raft, rotary-wi	ng aircraft						
Components	Targets: None Systems being Trained/Te	sted: None							
Standard	Aircraft safety	Typical Loca	ntions						
Operating		Range Com	plexes/Test	ing	Bays/Estuaries/Pierside:				
Procedures		Ranges:	presedy rest	в	None				
(Section		Mariana Isla	nds Trainin	g and					
2.3.3)		Testing Stud	ly Area						
Stressors to	Acoustic:	•	sturbance a		Energy:				
Biological	Aircraft noise		d aerial targe		In-air electromagnetic				
Resources	Explosive:	Military exp	pended mate	erials	devices				
	None	Ingestion:			Entanglement: None				
		Military exp than mu	pended mate initions	erials – othe	er				
Stressors to Physical Resources	Air Quality: Criteria air pollutants		Sediment Metals	s and Wate Other	r Quality: r materials				
Stressors to Human Resources	Cultural Resources: None	500.000	nomic Reso acoustics	Public Health and Safety: Physical interactions					
Military Expended Material	Ingestible Material: Per flare: one casing, one c pad or one plastic piston plastic endcap, one O-rir	ton, one Material							
	Non-Ingestible Material: None								
Sonar and Other	None								
Transducer									
Bins									

Electronic War	Electronic Warfare						
Counter Targe	Counter Targeting Flare Exercise - Aircraft						
Explosive	None						
Bins							
Procedural	None						
Mitigation							
Measures							
Assumptions	Approximately five flares per aircraft.						
Used for	This activity typically occurs greater than 12 NM from land. However, rotary-wing events may						
Analysis	occur closer to land (up to 3 NM when crew-served EW threat emitters [MANPADS] are						
	employed).						

A.1.5.4 Electronic Warfare Operations

Electronic War	fare									
Electronic War	fare Operations									
Short	Aircraft and surface ship cro	ews control po	ortions	Typical Dura	ation					
Description	of the electromagnetic spe	-	-	,						
	systems to degrade or deny		-	1–2 hours						
	to take defensive actions.	, , .	,							
Long		rews control the electromagnetic spectrum used by enemy systems								
Description		emy's ability to take defensive actions. Electronic Warfare								
•		e active or passive, offensive or defensive. Fixed-wing aircraft employ active eption against enemy search radars to mask the friendly inbound strike								
	jamming and deception ag									
	aircraft mission. Surface sh	on. Surface ships detect and evaluate enemy electronic signals from enemy								
	aircraft or missile radars, e	valuate course	es of actior	n concerning t	the use of passive or active					
	countermeasures, then use	e ship maneuv	ers and eit	her chaff, flar	res, active electronic					
	countermeasures, or a com	nbination of th	nem to def	eat the threat	t.					
Typical	Platforms: Fixed-wing aircr	•	-		patant					
Components	Targets: Aircraft targets; el		are targets							
	Systems being Trained/Te	sted: None								
Standard	Aircraft safety	Typical Loca	tions							
Operating	Vessel safety	Range Comp	olexes/Tes	ting	Bays/Estuaries/Pierside:					
Procedures		Ranges:	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	•6	None					
(Section		Mariana Isla	ınds Trainiı	ng and						
2.3.3)		Testing Stud		J						
Stressors to	Acoustic:	Physical Dis	turbance a	and Strike:	Energy:					
Biological	Aircraft noise	Aircraft and	aerial targ	gets	In-air electromagnetic					
Resources	Vessel noise	Vessels and	in-water d	levices	devices					
	Explosive:	Ingestion:			Entanglement:					
	None	None			None					
Stressors to	Air Quality:		Sedimen	ts and Water	Quality:					
Physical	Criteria air pollutants		Metals	C	ther materials					
Resources			-							
Stressors to	Cultural Resources:		nomic Res	ources:	Public Health and Safety:					
Human	None	Accessibil	•		Physical interactions					
Resources		Airborne								
		Physical d		and strike						
Military	Ingestible Material:		Military	None						
Expended Material	None		Recovera Material	bie						
iviateriai	Non-Ingestible Material:		wateriai							
	Expendable decoys									
Sonar and	None									
Other										
Transducer										
Bins										
Explosive	None									
Bins										
Procedural	Physical Disturbance and S	Strike Stressor	s: (Section	5.3.4)						
Mitigation	Vessel movement									
Measures										

Electronic War	Electronic Warfare						
Electronic Warfare Operations							
Assumptions	All chaff and flares involved in this event are covered under chaff exercise and flare exercises,						
Used for	respectively.						
Analysis							

A.1.6 EXPEDITIONARY WARFARE

A.1.6.1 Parachute Insertion

Expeditionary \	Warfare									
Parachute Inse										
Short	Military personnel train for	r covert insertio	n into	Typi	cal Duration					
Description	target areas using parachu		ľ	2–8 hours						
Long	These operations will vary in length depending on				ansportation method and systems					
Description	being used. Target areas are parachute drop zones that may be at sea or on land.									
Typical	Platforms: Fixed-wing aircraft, rotary-wing aircraft, tilt-rotor aircraft, small boat									
Components	Targets: None	, , , , , , , , , , , , , , , , , , , ,								
	Systems being Trained/Te	sted: None								
Standard	Aircraft safety	Typical Location	ons							
Operating	Vessel safety				- 1- 1 1- 1					
Procedures		Range Compl	exes/Tes	ting	Bays/Estuaries/Pierside:					
(Section		Ranges:	d- D	6	None					
2.3.3)		Mariana Islan	_	-						
		parachute dro	op zones;	Guan	n;					
Chusasaus ta	Acoustic:	Tinian; Rota		C4	uille. Francus					
Stressors to	Acoustic: Aircraft noise	Physical Distu			rike: Energy: None					
Biological Resources	Vessel noise	Aircraft and a	_	-						
Resources	vesser noise	vessei and in-	-water de	evices	Entanglement:					
	Explosive:	Ingestion:			None					
	None	None								
Stressors to	Air Quality:	Sediments and Water Quality:								
Physical	Criteria air pollutants									
Resources			Other ma	aterial	s					
Stressors to	Cultural Resources:	Socioecono	omic Res	ource	s: Public Health and Safety:					
Human	Physical disturbance and	Accessibilit	•		Physical interactions					
Resources	strike	Physical dis		e and s	strike					
		Airborne ac	coustics							
Military	Ingestible Material:		Military		Decelerators/parachutes					
Expended	None	-	Recovera	ble						
Material	Non-Ingestible Material:	ľ	Material							
	None									
Sonar and	None	·								
Other										
Transducer										
Bins										
Explosive	None									
Bins										
Procedural	Physical Disturbance and S	Strike Stressors:	(Section	5.3.4)					
Mitigation	Vessel movement									
Measures										
Assumptions	Combat swimmers inserted	d at sea may trai	nsit thro	ugh su	rf zone onto beach.					
Used for										
Analysis										

A.1.6.2 Personnel Insertion/Extraction

Expeditionary '	Warfare									
	rtion/Extraction									
Short	Military personnel train for	covert insert	ion and	Typical Du	uration					
Description	extraction into target areas			,,,						
•	fixed-wing (insertion only),		-	2–8 hours						
	submersibles.									
Long	Personnel train to approac	nel train to approach or depart an objective area using various transportation methods								
Description		ons train forces to insert and extract personnel and equipment day or								
	night. Tactics and techniqu	nniques employed include insertion from aircraft by parachute, by rope,								
	or from low, slow-flying he	ng helicopters from which personnel jump into the water. Parachute								
		to be conducted on surveyed drop zones to enhance safety. Insertion and								
	extraction methods also er									
Typical		raft, rotary-w	ing aircraft	, tilt-rotor a	ircraft, small craft, submersibles					
Components	Targets: None	_								
	Systems being Trained/Te									
Standard	Aircraft safety	Typical Loca	ations							
Operating Procedures	Vessel safety	Range Com	plexes/Tes	ting	Bays/Estuaries/Pierside:					
(Section		Ranges:	-		None					
2.3.3)		Mariana Isla	ands Range	Complex;						
2.3.3/		Guam; Tinia	n; Rota; Sa	iipan						
Stressors to	Acoustic:	Physical Di			Energy:					
Biological	Aircraft noise	Aircraft and		_	None					
Resources	Vessel noise	Vessel and in-water devices Entanglement:								
	Explosive:	Ingestion:		None						
	None	None								
Stressors to	Air Quality:		Sedimen	ts and Wat	er Quality:					
Physical	Criteria air pollutants		None							
Resources		.	-		.					
Stressors to	Cultural Resources:		nomic Res	ources:	Public Health and Safety:					
Human	Physical disturbance and	Accessib	•		Physical interactions					
Resources	strike	Physical		e and strike						
Military	Ingestible Material:		Military Recovera		elerators/parachutes					
Expended Material	None		Material	ible						
iviaterial	Non-Ingestible Material:		iviateriai							
	None									
Sonar and	None									
Other										
Transducer Bins										
	None									
Explosive Bins	None									
Procedural	Physical Disturbance and S	Strike Stresso	rs: (Section	5 3 4)						
Mitigation	Vessel movement	INC 311 C330	(30001011	J.J.+/						
Measures										
Assumptions	During the conduct of inser	rtion/extraction	on activitie	s personnel	may exit the watercraft in the					
Used for	_			-	orf zone and walk onto the beach.					
Analysis										
	<u> </u>									

A.1.7 MINE WARFARE

Mine warfare is the naval warfare area involving the detection, avoidance, and neutralization of mines to protect Navy ships and submarines, and offensive mine laying in naval operations. A naval mine is a self-contained explosive device placed in water to destroy ships or submarines. Naval mines are deposited and left in place until triggered by the approach of an enemy ship, or are destroyed or removed. Naval mines can be laid by purpose-built minelayers, other ships, submarines, or airplanes. Mine warfare training includes mine countermeasures exercises and mine laying exercises.

A.1.7.1 Civilian Port Defense

Mine Warfare								
Civilian Port De	efense							
Short Description	Maritime security personnel train to protect civilian ports and harbors against enemy efforts to interfere with access to those ports. Typical Duration Multiple days							
Long Description	Naval forces provide Mine Warfare capabilities to support Department of Homeland Security sponsored events. The three pillars of mine warfare, airborne (helicopter), surface (surface ships), and undersea (divers, marine mammals, and unmanned vehicles) mine countermeasures will be brought to bear in order to ensure strategic U.S. ports remain free of mine threats. Various mine warfare sensors, which utilize active acoustics, will be employed in the detection, classification, and neutralization of mines. Along with traditional mine warfare techniques, such as helicopter towed mine countermeasures, new technologies (unmanned vehicles) will be utilized. Event locations and scenarios will vary according to Department of Homeland Security strategic goals and evolving world events.							
Typical Components	Platforms: Mine warfare ship, rotary-wing aircraft, small boat, unmanned underwater vehicle Targets: Mine shapes Systems being Trained/Tested: Mine detection systems, towed mine neutralization systems, airborne mine neutralization system							
Standard	Vessel safety		Typical Locations					
Operating Procedures (Section 2.3.3)	Aircraft safety Unmanned aerial and underwater vehicle procedures Towed in-water device safety Laser Procedures Target deployment and retrieval safety Pierside testing safety	,	Range Complexes/Testing Ranges: Mariana Islands Range Complex	Maria	/Estuaries/Pierside: ana littorals and Outer Apra or			
Stressors to Biological Resources	Sonar and other transducers Aircraft noise Vessel noise Explosive: In-air explosions	Physical Disturbance and Strike: Aircraft and aerial targets Vessels and in-water devices Seafloor devices Military expended materials Ingestion: Military expended materials — munitions Military expended materials — other than munitions			rgy: vater electromagnetic devices ir electromagnetic devices anglement: es and cables elerators/Parachutes			

Mine Warfare									
Civilian Port De	efense								
Stressors to	Air Quality: Sediments and Water Quality:								
Physical	Criteria air pollutants		Explosives		•				
Resources	•		Metals						
			Chemicals						
			Other materia	ls					
Stressors to	Cultural Resources:	Socioeco	nomic Resource	es:	Public Health and Safety:				
Human	Explosives	Accessib	ility		In-air energy				
Resources	Physical disturbance and	Airborne	acoustics		Underwater energy				
	strike	Physical	disturbance and	strike	Physical interactions				
Military	Ingestible Material:		Military	Mine sh	apes (non-explosive)				
Expended	None		Recoverable						
Material	Non-Ingestible Material:		Material						
	None								
Sonar and	High-Frequency:	Synthet	ic Aperture Sona	ır:					
Other	HF4	SAS2	•						
Transducer									
Bins									
Explosive	None								
Bins									
Procedural	Acoustic Stressors: (Section 5	.3.2)	Physica	al Disturba	ance and Strike Stressors:				
Mitigation	Active sonar (Section 5.3.4)								
Measures	Vessel movement								
			Towed	in-water	devices				
Assumptions	Non-permanent mine shapes		-						
Used for	Shapes are varied, from abou				ng by 1 meter wide. They will				
Analysis	be recovered using normal as	sets, with	diver involvemen	ıt.					

A.1.7.2 Limpet Mine Neutralization System

Mine Warfare		-						
-	Neutralization System							
Short	Navy Explosive Ordnance D	-		ypical Dur	ation			
Description	small charge on a simulate	d underwater	mine. 2	hours				
Long	A metal sheet containing a	non-explosive	limpet mine	is lowered	I into the water, sometimes			
Description	from the side of a small ves	a small vessel, such as an LCM- 8 craft. Navy Explosive Ordnance Divers place a						
	single shock wave generate	generator of Limpet Mine Neutralizing Systems on the mine that is located						
	mid-water column, within v	hin water depths of 10 to 20 feet. A bag is placed over the mine to catch						
	falling debris.							
Typical	Platforms: Support craft							
Components	Targets: Mine Shapes							
·	Systems being Trained/Te	sted: None						
Standard	Vessel safety	Typical Locat	tions					
Operating	Target deployment and							
Procedures	retrieval safety	Range Comp	lexes/Testin	g	Bays/Estuaries/Pierside:			
(Section	,	Ranges:			Mariana littorals			
2.3.3)		None			Inner and Outer Apra Harbor			
Stressors to	Acoustic:	Physical Dis	turbance and	d Strike:	Energy:			
Biological	Vessel noise	=	in-water dev		None			
Resources								
	Explosive:	Ingestion:		Entanglement:				
	In-water explosions (de	None			None			
_	minimis)							
Stressors to	Air Quality:		Sediments		=			
Physical	Criteria air pollutants		Explosives	(Chemicals			
Resources			Metals					
Stressors to	Cultural Resources:		nomic Resou	rces:	Public Health and Safety:			
Human	Physical disturbance and	Accessibil			Physical interactions			
Resources	strike	Airborne a	isturbance a	na strike	Underwater energy			
B dilita a ma	to an atible 80 staniele	Allborne		Cult				
Military	Ingestible Material:		Military		urface target (stationary)			
Expended Material	None		Recoverable Material	2				
iviateriai	Non-Ingestible Material:		iviateriai					
	None							
Sonar and	None	-		-				
Other								
Transducer								
Bins								
Explosive	None							
Bins								
Procedural	Physical Disturbance and S	trike Stressors	s: (Section 5	3.4)				
Mitigation	Vessel movement							
Measures								
casarcs								
Assumptions	De minimis small explosive	charges would	d be used dur	ring this ac	tivity and not quantitatively			
	De minimis small explosive analyzed and therefore are	_		_	tivity and not quantitatively			

A.1.7.3 Mine Neutralization – Remotely Operated Vehicle Sonar

Mine Warfare							
	zation – Remotely Operated	Vehicle Sonar	•				
Short	Ship, small boat, and helic			Typic	cal Duration		
Description	disable mines using remot underwater vehicles.	•			nours		
Long		ip, small boat, and helicopter crews utilize remotely operated vehicles to neutralize pot					
Description	•	-			tical systems to locate and target mine		
		neutralizers may be used during live-fire events.					
Typical		ircraft, surface combatants, small boat					
Components	Targets: Mine shapes						
	Systems being Trained/Te	ested: Towed s	onar systen	ns, ur	nderwater explosives		
Standard	Aircraft safety	Typical Loca	tions				
Operating	Towed in-water device	Range Comp	lexes/Test	ing	Bays/Estuaries/Pierside:		
Procedures	safety	Ranges:	reacy rest	…в	Mariana littorals		
(Section	Vessel safety	Mariana Isla	nds Training	g and			
2.3.3)	Target deployment and retrieval safety	Testing Stud	7	_	·		
Stressors to	Acoustic:	Physical Dis	turbance a	nd St	rike: Energy:		
Biological	Sonar and other	Aircraft and			In-air electromagnetic		
Resources	transducers	Vessels and	in-water de	evices	devices		
	Aircraft noise	Military exp	ended mate	erials	In-water electromagnetic		
	Vessel noise	Seafloor dev	vices		devices		
	Explosive:	Ingestion:			Entanglement:		
	In-water explosions	Military exp	ended mate	erials	 Wires and cables 		
		munition					
		Military expended materials – other than munitions					
Stressors to	Air Quality:		Sediment	s and	Water Quality:		
Physical	Criteria air pollutants		Explosives	S			
Resources			Metals				
Stressors to	Cultural Resources:		nomic Reso	urces			
Human	Explosives	Accessibil	•		Underwater energy		
Resources	Physical disturbance and	Airborne		ماممم	Physical interactions		
BA:lika	strike		listurbance		Mine shapes (non-explosive)		
Military Expended	Ingestible Material: Neutralizer fragments		Recoverab		wiffe snapes (non-explosive)		
Material	_		Material)ie			
Material	Non-Ingestible Material:		Material				
	Fiber optic cable, fiber opt	ic can					
Sonar and Other	None						
Transducer							
Bins							
Explosive	E4						
Bins							
Procedural	Explosive Stressors: (Section	-	Ph	-	l Disturbance and Strike Stressors:		
Mitigation	Explosive Mine Counterme			•	tion 5.3.4)		
Measures	Neutralization Activitie	es			movement		
			То	wed i	in-water devices		

Mine Warfare	Mine Warfare				
Mine Neutraliz	ration – Remotely Operated Vehicle Sonar				
Assumptions	Fiber optic cable is only expended during use of explosive mine neutralizers.				
Used for					
Analysis					

A.1.7.4 Mine Countermeasure Exercise – Surface Ship Sonar

Mine Warfare						
	measure Exercise – Surface S	onar				
Short Description	Ship crews detect, locate, in mines while navigating rest channels, such as while ent	tricted areas o	or	Typical Duration Up to 15 hours		
Long Description	This event trains ship crews to detect mines for future neutralization or to alert other ships. Training utilizes simulated minefields constructed of moored or bottom mines, or instrumented mines that can record effectiveness of mine detection efforts. Ships will use active sonar to search the area ahead of the ship for moored mines or other hazards of navigation.					
Typical Components	Platforms: Mine sweeper, Targets: Mine shapes Systems being Trained/Te			nar, mid-frequency sonar		
Standard	Vessel safety	Typical Loca	ations			
Operating Procedures (Section 2.3.3)	Target deployment and retrieval safety	Range Complexes/Testing Ranges: Bays/Estuaries/Pierside Mariana Islands Training and Apra Harbor Testing Study Area				
Stressors to Biological Resources	Acoustic: Sonar and other transducers Vessel noise Explosive: None	Physical Dis Vessels and Seafloor de Ingestion: None	l in-water d	~ · · · · · · · · · · · · · · · · · · ·		
Stressors to Physical Resources	Air Quality: Criteria air pollutants		Sediment None	ts and Water Quality:		
Stressors to Human Resources	Cultural Resources: None	Socioeco Accessibi	nomic Reso	ources: Public Health and Safety: Underwater energy Physical interactions		
Military Expended Material	Ingestible Material: None Non-Ingestible Material: None	·	Military Recoverat Material	Mine shapes (non-explosive)		
Sonar and Other Transducer Bins	High-Frequency Sonar HF4	Mid-Fred MF1K	quency Son	nar		
Explosive Bins	None					
Procedural Mitigation Measures	Acoustic Stressors: (Section Active sonar	n 5.3.2)		hysical Disturbance and Strike Stressors: (Section 5.3.4) essel movement		
Assumptions Used for Analysis	Existing placed mine shape temporarily placed mine	_		ity (buoys) to be used. There is potential for		

A.1.7.5 Mine Countermeasure – Towed Mine Neutralization

Mine Warfare						
	neasures – Towed Mine Neu	utralization				
Short	Helicopter aircrews, mann		Typical Duratio	n		
Description	vehicles tow systems throu	ugh the water which	Up to 12 hours			
Long Description	are designed to disable or trigger mines. Helicopter, vehicle operators and unmanned vehicles use towed devices to trigger mines that are designed to detonate when they detect ships/submarines by engine/propeller sounds or magnetic (steel construction) signature. Towed devices can also employ cable cutters to detach floating moored mines. Training will be conducted either with non-explosive training mine shapes or without any mine shapes. A high degree of pilot skill is required in deploying devices, safely towing them at relatively low speeds and altitudes, and then recovering devices. Devices used may include the following: Organic Airborne and Surface Influence Sweep (OASIS). The Organic Airborne and Surface Influence Sweep is a towed device that imitates the magnetic and acoustic signatures of naval ships and submarines. MK 105 sled: the MK 105 sled, similar to the Organic Airborne and Surface Influence Sweep, creates a magnetic field used to trigger mines. The MK 105 sled can also be used in conjunction with the MK 103 cable cutter system and the MK 104 acoustic countermeasure. AN/SPU-1/W "Magnetic Orange Pipe": As the name implies, the AN/SPU-1/W is a magnetic pipe that is used to trigger magnetically					
Typical Components	influenced mines. Platforms: Mine warfare ship, rotary-wing aircraft, unmanned surface vehicle Targets: Mine Shapes Systems being Trained/Tested: Electromagnetic devices					
Standard	Aircraft safety	Typical Locations				
Operating Procedures (Section 2.3.3)	Towed in-water device safety Vessel safety Unmanned surface vehicle safety Pierside testing safety Target deployment and retrieval safety	Range Complexes/Tes Ranges: Mariana Islands Trainin Testing Study Area	Α	ays/Estuaries/Pierside: pra Harbor		
Stressors to	Acoustic:	Physical Disturbance	and Strike:	Energy:		
Biological Resources	Aircraft noise Vessel noise Explosive: None	Aircraft and aerial target Vessels and in-water devices Seafloor devices Ingestion: None Energy. In-water electromagnetic devices In-air electromagnetic devices Entanglement: None				
Stressors to Physical Resources	Air Quality: Criteria air pollutants	Sedimen None	ts and Water Qu			
Stressors to Human Resources	Cultural Resources: Physical disturbance and strike	Socioeconomic Res Accessibility Airborne acoustics Physical disturbance	U In	ublic Health and Safety: nderwater energy n-air energy hysical interactions		

Mine Warfare	Mine Warfare						
Mine Countern	Mine Countermeasures – Towed Mine Neutralization						
Military	Ingestible Material:	Military	Mine shape (non-explosive)				
Expended	None	Recoverable					
Material	Non-Ingestible Material: None	Material					
Sonar and	None						
Other							
Transducer							
Bins							
Explosive	None						
Bins							
Procedural	Physical Disturbance and Strike Stressors: (Section 5.3.4)						
Mitigation	Vessel movement						
Measures	Towed in-water devices						
Assumptions	Mechanical sweeping (cable cutting), acoustic and magnetic influence sweeping devices are						
Used for	towed from helicopters, surface vessels, and unmanned vehicles. Cable cutters utilize an						
Analysis	insignificant charge (similar to a shotgun shell). Acoustic sweeps generate ship type noise						
	via a mechanical system. Towing syst	•	•				
	deploy, tow, and recover) may involv	e instrumented	mines.				
	Mine shapes would be recovered.						

A.1.7.6 Mine Countermeasure – Towed Mine Detection

Mine Warfare							
	neasures – Towed Mine Dete	ection					
Short	Helicopter aircrews, manne		Typical Durat	ion			
Description	vehicles detect mines using detection systems.		Typically 1.5 hours up to 4 hours				
Long		elicopter aircrews, manned and unmanned vehicles use towed and airborne devices to					
Description	detect, locate, and classify potential mines. Towed devices employ active acoustic sources, such as high-frequency and side scanning sonar. These devices are similar in function to systems used to map the seafloor or locate submerged structures/items. Airborne devices utilize laser systems to locate mines located below the surface. Devices used include the ANAQS-20/A, towed mine-hunting sonar used to detect and classify bottom and floating/moored mines in deep and shallow water, and the Airborne Laser Mine Detection System, developed to detect and classify floating and near-surface, moored mines.						
Typical	Platforms: Mine warfare sh	ip, rotary-wing aircraft,	unmanned sur	face vehicles			
Components	Targets: Mine shapes						
	Systems being Trained/Tes	ted: Mine detection sy	stems				
Standard	Aircraft safety	Typical Location	S				
Operating Procedures	Vessel safety Unmanned surface vehicle	Range Complexe	es/Testing	Bays/Estuaries/Pierside:			
(Section	safety	Ranges:		Apra Harbor			
2.3.3)	Laser Procedures	Mariana Islands Training and Testing Study Area					
	Target deployment and retrieval safety						
Stressors to	Acoustic:	Physical Disturbance	and Strike:	Energy:			
Biological	Aircraft noise	Aircraft and aerial tar		None			
Resources	Vessel noise	Vessels and in-water	devices	Entanglement:			
	Explosive:	Seafloor devices		None			
	None	Ingestion:					
		None					
Stressors to	Air Quality:	Sediments and Water Quality:					
	•	Sedimer	None				
Physical	Criteria air pollutants		unu viutei e	quanty.			
Resources	Criteria air pollutants	None					
Resources Stressors to	Criteria air pollutants Cultural Resources:	None Socioeconomic Res		Public Health and Safety:			
Resources Stressors to Human	Criteria air pollutants Cultural Resources: Physical disturbance and	Socioeconomic Res		Public Health and Safety: Underwater energy			
Resources Stressors to	Criteria air pollutants Cultural Resources:	Socioeconomic Res Accessibility Airborne acoustics	ources:	Public Health and Safety: Underwater energy In-air energy			
Resources Stressors to Human Resources	Criteria air pollutants Cultural Resources: Physical disturbance and strike	Socioeconomic Res Accessibility Airborne acoustics Physical disturbanc	ources: e and strike	Public Health and Safety: Underwater energy In-air energy Physical interactions			
Resources Stressors to Human Resources Military	Criteria air pollutants Cultural Resources: Physical disturbance and	Socioeconomic Res Accessibility Airborne acoustics	e and strike Mine sh	Public Health and Safety: Underwater energy In-air energy			
Resources Stressors to Human Resources	Criteria air pollutants Cultural Resources: Physical disturbance and strike Ingestible Material: None	Socioeconomic Res Accessibility Airborne acoustics Physical disturbanc Military	e and strike Mine sh	Public Health and Safety: Underwater energy In-air energy Physical interactions			
Resources Stressors to Human Resources Military Expended	Criteria air pollutants Cultural Resources: Physical disturbance and strike Ingestible Material: None Non-Ingestible Material:	Socioeconomic Res Accessibility Airborne acoustics Physical disturbanc Military Recovera	e and strike Mine sh	Public Health and Safety: Underwater energy In-air energy Physical interactions			
Resources Stressors to Human Resources Military Expended Material	Criteria air pollutants Cultural Resources: Physical disturbance and strike Ingestible Material: None	Socioeconomic Res Accessibility Airborne acoustics Physical disturbanc Military Recovera	e and strike Mine sh	Public Health and Safety: Underwater energy In-air energy Physical interactions			
Resources Stressors to Human Resources Military Expended	Criteria air pollutants Cultural Resources: Physical disturbance and strike Ingestible Material: None Non-Ingestible Material: None	Socioeconomic Res Accessibility Airborne acoustics Physical disturbanc Military Recovera	e and strike Mine sh	Public Health and Safety: Underwater energy In-air energy Physical interactions			
Resources Stressors to Human Resources Military Expended Material Sonar and	Criteria air pollutants Cultural Resources: Physical disturbance and strike Ingestible Material: None Non-Ingestible Material: None	Socioeconomic Res Accessibility Airborne acoustics Physical disturbanc Military Recovera	e and strike Mine sh	Public Health and Safety: Underwater energy In-air energy Physical interactions			
Resources Stressors to Human Resources Military Expended Material Sonar and Other	Criteria air pollutants Cultural Resources: Physical disturbance and strike Ingestible Material: None Non-Ingestible Material: None	Socioeconomic Res Accessibility Airborne acoustics Physical disturbanc Military Recovera	e and strike Mine sh	Public Health and Safety: Underwater energy In-air energy Physical interactions			
Resources Stressors to Human Resources Military Expended Material Sonar and Other Transducer	Criteria air pollutants Cultural Resources: Physical disturbance and strike Ingestible Material: None Non-Ingestible Material: None	Socioeconomic Res Accessibility Airborne acoustics Physical disturbanc Military Recovera	e and strike Mine sh	Public Health and Safety: Underwater energy In-air energy Physical interactions			

Mine Warfare	Mine Warfare				
Mine Countern	measures – Towed Mine Detection				
Procedural	Physical Disturbance and Strike Stressors: (Section 5.3.4)				
Mitigation	Towed in-water devices				
Measures	Vessel movement				
Assumptions	Sonar mine detection systems towed from helicopters and surface vessels.				
Used for	Airborne laser systems used to detect mine shapes.				
Analysis	Laser systems are similar to commercial Light Detection And Ranging systems. The in-air low				
	energy laser stressor was used in analysis of potential impacts on human resources.				
	Mine shapes may be deployed via ship and will be recovered.				

A.1.7.7 Mine Countermeasure Exercise – Towed Sonar

Mine Warfare						
	measure Exercise – Towed Sona	r				
Short	Surface ship crews detect and	avoid mir	nes .	Typical Dur	ation	
Description	while navigating restricted areas or channels using towed active sonar systems.			1–4 hours		
Long Description	Surface vessel crews detect and avoid mines or other underwater hazardous objects while navigating restricted areas or channels using active sonar. Littoral Combat Ship utilizes unmanned surface vehicles and remotely operated vehicles to tow mine detection (hunting) equipment. Systems will operate from shallow zone greater than 40 feet to deep water. Events could be embedded in major training events.					
Typical Components	Platforms: Surface combatant, Targets: Mine shapes Systems being Trained/Tested				anned surface vehicles	
Standard	Unmanned aerial, surface, and	Typica	al Locations			
Operating Procedures (Section 2.3.3)	subsurface vehicle safety Vessel safety Laser Procedures Target deployment and retrieval safety	Range Complexes/Testing Ranges: Mariana Islands Training and Testing Study Area Bays/Estuaries/Piers Apra Harbor				
Stressors to Biological Resources	Sonar and other Ai transducers Ve Vessel noise Se Explosive: In	rcraft and	sturbance a d aerial targe in-water dev evices	ets	Energy: In-air electromagnetic devices In-water electromagnetic devices Entanglement: None	
Stressors to Physical Resources	Air Quality: Criteria air pollutants		Sediments Explosives	and Wate	r Quality:	
Stressors to Human Resources	Physical disturbance and strike	Accessibi Airborne	nomic Resolity acoustics disturbance		Public Health and Safety: Underwater energy Physical interactions	
Military Expended Material	Ingestible Material: None Non-Ingestible Material: None		Military Recoverab Material	Mine	shapes (non-explosive)	
Sonar and Other Transducer Bins	High Frequency: HF4					
Explosive Bins	None					
Procedural Mitigation Measures	Acoustic Stressors: (Section 5.3 Active sonar	3.2)	Ves	ysical Distu (Section 5 ssel movem ved-in wate	ent	

Mine Warfare	Mine Warfare					
Mine Countern	Mine Countermeasure Exercise – Towed Sonar					
Assumptions	No explosives used.					
Used for	Constraints: Assume system will be operated in areas free of obstructions, and will be towed					
Analysis	well above the seafloor. Towed system will be operated in a manner to avoid entanglement and					
	damage. Events will take place in water depths 40 feet and greater.					
	Existing placed mine shapes to be used. Potential for temporary placement of mine shapes.					

A.1.7.8 Mine Laying

Mine Warfare								
Mine Laying								
Short	Fixed wing sineraft drap a	an avalaciva	mino Tu	nical Duration				
Description	Fixed-wing aircraft drop no	on-explosive		pical Duration nour				
-	shapes.	nsive or defe	l l					
Long				r a tactical advantage for friendly forces.				
Description			•	specific tactical situations. The aircrew				
		ultiple passes in the same flight pattern, and drop one or more training four shapes total). Training shapes are non-explosive and are recovered wh						
	possible.	pes total). Training snapes are non-explosive and are recovered when						
Typical	Platforms: Fixed-wing airc	raft sunnort	veccels					
Components	Targets: Mine shapes	rait, sapport	VC33C13					
Components	Systems being Trained/Te	ested: None						
Standard	Aircraft safety	Typical Loc	ations					
Operating	Target deployment and	Panga Cam	plexes/Testing	Bays/Estuaries/Pierside:				
Procedures	retrieval safety	Ranges:	piekes/ restilig	None				
(Section		_	ands Training a					
2.3.3)			dy Area, Primar					
		_	ial Use Airspace					
		nearshore f	•	-,				
Stressors to	Acoustic:	Physical Di	isturbance and	Strike: Energy:				
Biological	Aircraft noise		d aerial targets					
Resources	Vessel noise		pended materia	als				
	Evalorivo	Seafloor de	evices	Entanglement: None				
	Explosive: None	Ingestion:		None				
	None	None						
Stressors to	Air Quality:		Sediments a	nd Water Quality:				
Physical	Criteria air pollutants		Metals	, , , , , , , , , , , , , , , , , , ,				
Resources	·							
Stressors to	Cultural Resources:	Socioeco	onomic Resour	ces: Public Health and Safety:				
Human	Physical disturbance and	Accessib	ility	Physical interactions				
Resources	strike	Airborne	acoustics					
		Physical	disturbance an	d strike				
Military	Ingestible Material:		Military	Mine shapes (non-explosive)				
Expended	None		Recoverable					
Material	Non-Ingestible Material:		Material					
	Mine shapes (non-explosiv	re)						
Sonar and	None							
Other								
Transducer								
Bins								
Explosive	None							
Bins								
Procedural	Physical Disturbance and S		ors: (Section 5.3	3.4)				
Mitigation	Non-explosive bombs and	mine shapes						
Measures								
Assumptions	Mine laying is similar to a r	-	_					
Used for			•	assume they will not for the analysis.				
Analysis	Nearshore/shallow water of	events will be	planned to mi	nimize/avoid coral impacts.				

A.1.7.9 Mine Neutralization – Explosive Ordnance Disposal

Mine Warfare								
	ation Explosive Ordnance D	isposal						
Short	Personnel disable threat m	nines using expl	osive Ty	oical Durati	on			
Description	charges.			to 4 hours				
Long	Navy divers, typically explo	losive ordnance disposal personnel, disable threat mines with						
Description	explosive charges to create	e a safe channe	l for friendly v	essels to tr	ansit.			
	Personnel detect, identify.	evaluate, and r	neutralize min	es in the w	ater with an explosive device			
	and may involve detonatio							
		rations are normally conducted during daylight hours for safety reasons						
	Time delay fuses may be u	sed for these a	vents					
Typical	Platforms: Rotary-wing air							
Components	Targets: Mine shapes	crart, siriali boa	113					
	Systems being Trained/Te	sted: None						
Standard	Underwater detonation	Typical Locati	ions					
Operating	safety	Panga Compl	exes/Testing	Pangos	Bays/Estuaries/Pierside:			
Procedures	Aircraft safety		erwater detor	_	None			
(Section	Vessel safety	site						
2.3.3)	Target deployment and retrieval safety	Piti and Outer	r Apra Harbor					
	retrieval safety	underwater d	letonation site	es				
Stressors to	Acoustic:		urbance and	Strike:	Energy:			
Biological	Aircraft noise	Aircraft and a	_		None			
Resources	Vessel noise		n-water devic		Entanglement:			
	Explosive:	Seafloor devi	ended materia	None				
	In-water explosions		ices					
		Ingestion:						
			ended materia	ıls –				
		munitions Military expe	s ended materia	ds — othor				
		than mun		iis – otilei				
Stressors to	Air Quality:		Sediments a	nd Water O	uality:			
Physical	Criteria air pollutants		Explosives		emicals			
Resources	,		Metals		ner materials			
Stressors to	Cultural Resources:	Socioecon	omic Resourc	es:	Public Health and Safety:			
Human	Explosives	Accessibilit	•		Underwater energy			
Resources	Physical disturbance and	Airborne a			Physical interactions			
	strike		sturbance and					
Military	Ingestible Material:		Military	Mine sh	apes (non-explosive)			
Expended Material	Target fragments		Recoverable Material					
waterial	Non-Ingestible Material:		iviaterial					
	None							
Sonar and	None							
Other								
Transducer								
Bins								

Mine Warfare	Mine Warfare						
Mine Neutraliz	Mine Neutralization Explosive Ordnance Disposal						
Explosive	E5 E6						
Bins							
Procedural	Explosive Stressors: (Section 5.3.3)	Physical Disturbance and Strike Stressors:					
Mitigation	Explosive Mine Neutralization Activities	(Section 5.3.4)					
Measures	Involving Navy Divers	Vessel movement					
Assumptions	Charge placed anywhere in water column, in	cluding bottom.					
Used for	Mine shapes will be recovered when practical	able. Some will explode, and fragments will not be					
Analysis	recovered.						
	Agat Bay underwater detonation site has a maximum charge size of 20 lb. net explosive weight						
	(NEW). Piti and Outer Apra Harbor underwat	er detonation sites have a maximum charge size of					
	10 lb. NEW.						

A.1.7.10 Submarine Mine Exercise

Mine Warfare					
Submarine Mine	Exercise				
	ı		Tuning	I Downstians	
Short	Submarine crews practic	e detecting mines in		I Duration	
Description	designated area.		Varies		
Long				ines or other underwater hazardous	
Description				ch as while entering or leaving port.	
				nines. Training utilizes simulated	
			•	nstrumented mines that can record	
			-	ing exercise, submarine crews will	
				hapes. Each mine avoidance exercise	
	minefield	operating the high-in	equency so	nar to navigate through the training	
The stand					
Typical	Platforms: Submarines				
Components	Targets: Mine shapes	Taskadı Iliah fusayısı	a a a .a a .a . / la		
a	Systems being Trained/		cy sonar (n	uii mountea)	
Standard	Vessel safety	Typical Locations			
Operating	Target deployment	Range Complexes/	Testing	Bays/Estuaries/Pierside:	
Procedures	and retrieval safety	Ranges:	J		
(Section 2.3.3)		Mariana Islands Tra	ining and		
		Testing Study Area		٠,	
		littorals			
Stressors to	Acoustic:	Physical Disturban	ce and Stril	ke: Energy:	
Biological	Sonar and other	Vessels and in-wat	er devices	None	
Resources	transducers	Military expended	materials	Futan alamant.	
	Explosive:	Seafloor Devices		Entanglement: None	
	None	Ingestion:		None	
	None	None			
Stressors to	Air Quality:		ents and V	Vater Quality:	
Physical	None	None	icinto ana i	rate. Quanty.	
Resources					
Stressors to	Cultural Resources:	Socioeconomic I	esources:	Public Health and Safety:	
Human	None	None		Underwater energy	
Resources				Physical interactions	
Military	Ingestible Material:	Milita	v	Vine shapes (non-explosive)	
Expended	None	Recov	-		
Material		Mater			
	Non-Ingestible Material				
_	None				
Sonar and	High Frequency:				
Other	HF1				
Transducer					
Bins					
Explosive Bins	None				
Procedural	Acoustic Stressors: (Section 2)	ion 5.3.2)	-	Disturbance and Strike Stressors:	
Mitigation	Active sonar		•	on 5.3.4)	
Measures	Vessel movement				

Mine Warfare	
Submarine Mine	Exercise
Assumptions	There is potential for temporarily placed mine shapes to be used.
Used for	
Analysis	

A.1.7.11 Surface Ship Object Detection

Mine Warfare						
Surface Ship Ob	ject Detection					
Short	Ship crews detect and avo	id mines while	2	Typica	l Duration	
Description	navigating restricted areas or channels using active sonar.			Up to 15 hours		
Long Description	Surface ship crews detect and avoid mines or other underwater hazardous objects while navigating restricted areas or channels using active sonar. A Littoral Combat Ship utilizes unmanned surface vehicles and remotely operated vehicles to tow mine detection (hunting) equipment. Systems will operate from a shallow zone greater than 40 feet (ft.) to deep water. Events could be embedded within major training exercises.					
Typical	Platforms: Surface comba					
Components	Targets: Sub-surface targe aggregating devices) Systems being Trained/Te systems		_		ortunity (buoys, fish	
Standard	Vessel safety	Typical Locat	tions			
Operating Procedures (Section 2.3.3)	Unmanned aerial and underwater vehicle procedures Towed in-water device safety Target deployment and	Range Comp Ranges: Mariana Islai Testing Stud	Bays/Estuaries/Pierside: Apra Harbor			
	retrieval safety		- •			
Stressors to Biological Resources	Acoustic: Sonar and other transducers Vessel noise Explosive: None	Physical Dis Vessels and Seafloor dev Ingestion: None	in-water d		ke: Energy: None Entanglement: None	
Stressors to	Air Quality:	-	Sediment	s and \	Water Quality:	
Physical Resources	Criteria air pollutants		None		,	
Stressors to Human Resources	Cultural Resources: Physical disturbance and strike	Socioeconomic Resources: Accessibility Physical disturbance and strike			Public Health and Safety: Underwater energy rike In-air energy Physical interactions	
Military Expended Material	Ingestible Material: None Non-Ingestible Material: None		Mine shapes (non-explosive)			
	Mid-Frequency:	High-Fred	quency:			
Sonar and Other Transducer Bins	MF1K	None				

Mine Warfare	Mine Warfare						
Surface Ship Ob	Surface Ship Object Detection						
Procedural	Acoustic Stressors:	Physical Disturbance and Strike:					
Mitigation	Active sonar	Vessel movement					
Measures		Towed in-water devices					
Assumptions	No explosives are used.						
Used for	Constraints: Assume system will be o	perated in areas free of obstructions, and will be towed					
Analysis	well above the seafloor. Towed system will be operated in a manner to avoid entanglement						
	and damage. Events will take place in water depths 40 ft. and greater.						
	Existing placed mine shapes/targets of opportunity to be used. There is the potential for						
	temporary placement of mine shapes.						
	Potential locations for this activity in	clude Mariana Littorals and Apra Harbor.					

A.1.7.12 Underwater Demolition Qualification and Certification

Mine Warfare						
Underwater D	emolition Qualification and	Certification				
Short	Navy divers conduct various			Typical D	uration	
Description	and certification in placing		, j			
	demolition charges.			Varies		
Long	Underwater explosive cha	rges, up to 20) lb. net expl	osive we	ight are detonated to complete	
Description	training qualification or ce	rtification.				
Typical	Platforms: Rotary-wing air	craft, small b	oats			
Components	Targets: Mine shapes					
	Systems being Trained/Te	ested: None				
Standard	Aircraft safety	Typical Loca	ations			
Operating	Vessel safety	Danga Cam	nlavas/Tast		Paye/Fetuaries/Diagoides	
Procedures	Underwater detonation		plexes/Test	ing	Bays/Estuaries/Pierside: None	
(Section	safety	Ranges:	nderwater de	tonation		
2.3.3)	Target deployment and	site	idei watei de	conation	l	
	retrieval safety		ter Apra Har	hor		
			detonation			
Stressors to	Acoustic:		sturbance a		: Energy:	
Biological	Aircraft noise	-	d aerial targe		None	
Resources	Vessel noise	Vessels and in-water devices				
			pended mat		Entanglement:	
	Explosive:	Seafloor devices None				
	In-air explosions					
	In-water explosions	Ingestion:				
		Military ov	pended mat	orials – o	thor	
		than mu	-	eriais – o	uiei	
Stressors to	Air Quality:	trair me		s and Wa	ter Quality:	
Physical	Criteria air pollutants		Explosives		Chemicals	
Resources	Circeila dii poliatalits		Metals	•	Other materials	
Stressors to	Cultural Resources:	Socioeco	nomic Reso	iirces.	Public Health and Safety:	
Human	Explosives	Accessib		u. 000.	Underwater energy	
Resources	Physical disturbance and		acoustics		Physical interactions	
	strike	Physical	disturbance	and strik		
Military	Ingestible Material:	•	Military	Noi		
Expended	Target fragments		Recoverab			
Material	Nam Impostible Materials		Material			
	Non-Ingestible Material: Mine shape (non-explosive	۱۵				
Sonar and	None	-1				
Other	NOTE					
Transducer						
Bins						
Explosive	E5 E6	-				
Bins						
Procedural	Explosive Stressors: (Section	on 5.3 3)	Ph	vsical Dis	turbance and Strike Stressors:	
Mitigation	Explosive mine neutralizati	-		(Section		
Measures	involving Navy divers	on donvinco	Ve	ssel move	•	

Mine Warfare	Mine Warfare					
Underwater Demolition Qualification and Certification						
Assumptions	Agat Bay underwater detonation site has a maximum charge size of 20 lb. net explosive weight					
Used for	(NEW). Piti and Outer Apra Harbor underwater detonation sites have a maximum charge size of					
Analysis	10 lb. NEW.					

A.1.8 STRIKE WARFARE

A.1.8.1 Bombing Exercise (Air-to-Ground)

Strike Warfare							
Bombing Exerc	ise (Air-to-Ground)						
Short	Fixed-wing aircraft drop bo	ombs against a	a land	Турі	ical Durati	on	
Description	target.	_		1–2 hours			
Long	Bombing exercise involves	training of bo	mber or st	rike fi	ighter airc	raft delivery of ordnar	nce
Description	against land targets in day	or night cond	itions. The	bomb	oing exerci	se may involve close a	air
	support training in direct support of and in close proximity to forces on the ground, such as						
	Navy or Marine forces eng	aged in trainir	ng exercise	s on la	and, and n	nay include the use of	
	targeting laser.						
Typical	Platforms: Fixed-wing airci	raft					
Components	Targets: Land targets	-4					
	Systems being Trained/Te			tems			
Standard	Aircraft safety Laser Procedures	Typical Loca			-		_
Operating Procedures	Laser Procedures	Range Com	plexes/Tes	ting		Bays/Estuaries/Piersi	de:
(Section		Ranges:	Madinilla	D 730		None	
2.3.3)		Farallon de 7201A	ivieuiiiiia,	N-/20)1, N-		
Stressors to	Acoustic:	Physical Dis	sturhance :	and S	trike	Energy:	
Biological	Aircraft noise	Aircraft and			erike.	None	
Resources		Military exp	_	-			
	Explosive: None					Entanglement:	
	None	Ingestion: None None				None	
Stressors to	Air Quality:	None	Sedimen	ts and	d Water Q	uality:	
Physical	Criteria pollutants		Metals				
Resources	F						
Stressors to	Cultural Resources:	Socioeco	nomic Res	ource	es: l	Public Health and Safe	ety:
Human	Explosives	Airborne	acoustics		I	None	
Resources	Physical disturbance and						
	strike	-			r -		
Military	Ingestible Material:		Military		None		
Expended Material	None		Recovera Material	bie			
iviateriai	Non-Ingestible Material:		iviateriai				
	None						
Sonar and	None						
Other							
Transducer Bins							
Explosive	None						
Bins	None						
Procedural	None						
Mitigation							
Measures							
Assumptions	Bombs are released in acco	rdance with r	ange stand	lard o	perating p	procedures. Land targe	ets
Used for	only.				٠.		
Analysis							

A.1.8.2 Gunnery Exercise (Air-to-Ground)

Strike Warfare						
	ise (Air-to-Ground)					
Short	Helicopter crews fire guns	at stationary	land	Typical Dur	ration	
Description	targets; fixed-wing aircraft also strafe land targets.			1 hour		
Long Description	Fixed-wing aircraft and helicopter crews use guns to attack ground targets, day or night, with the goal of destroying or disabling enemy vehicles, structures, or personnel. Aircraft will fire a burst of rounds, then break off and reposition for another strafing run until each aircraft expends its exercise ordnance allowance. This exercise may include the use of targeting laser.					
Typical Components	Platforms: Fixed-wing aircontagets: Land targets Systems being Trained/Te	·	_	ems		
Standard	Aircraft safety	Typical Loca	itions			
Operating Procedures (Section 2.3.3)	Weapons firing safety Laser procedures	Range Complexes/Testing Bays/Estuaries/Pierside Ranges: None Farallon de Medinilla, R 7201, R 7201A				
Stressors to Biological Resources	Acoustic: Aircraft noise Weapons noise Explosive: None	Physical Disturbance and Strike: Aircraft and aerial targets Military expended materials Ingestion: Military expended materials – munitions Energy: None Entanglement: None				
Stressors to Physical Resources	Air Quality: Criteria pollutants		Sediment Metals	s and Wate	r Quality:	
Stressors to Human Resources	Cultural Resources: Explosives Physical disturbance and strike		nomic Reso acoustics	urces:	Public Health and Safety: None	
Military Expended Material	Ingestible Material: Projectile casings Non-Ingestible Material: None	·	Military Recoverab Material	None None	•	
Sonar and Other Transducer Bins	None			·		
Explosive Bins	None					
Procedural Mitigation Measures	None					
Assumptions Used for Analysis	Land based targets only					

A.1.8.3 Missile Exercise

Strike Warfare							
Missile Exercis	e (MISSILEX)						
Short Description	Missiles or rockets are laur target.	nched against a		Typical Duration 1–2 hours			
Long Description	Fixed-wing aircraft, helicopter, ship or submarine crews use missiles to attack ground targets, day or night, with the goal of destroying or disabling enemy vehicles, structures, or personnel.						
Typical Components	Platforms: Fixed-wing aircraft, rotary-wing aircraft, surface ships, submarines Targets: Land targets Systems being Trained/Tested: Targeting Lasers						
Standard	Aircraft safety	Typical Locat	tions				
Operating Procedures (Section 2.3.3)	Weapons firing safety Vessel safety Laser Procedures	Range Comp Ranges: Farallon de N 7201A		1, R	Bays/Estuaries/Pierside: None	:	
Stressors to Biological Resources	Acoustic: Aircraft noise Weapons noise Vessel noise	Physical Disturbance and Strike: Aircraft and aerial target Military expended materials Vessel and in-water device				Energy: None Entanglement: None	
	Explosive: None	Ingestion: None					
Stressors to Physical Resources	Air Quality: Criteria pollutants	Sediments and Water Quality: Metals					
Stressors to Human Resources	Cultural Resources: Explosives Physical disturbance and strike	Socioecon Airborne a	omic Reso acoustics	urces	::	Public Health and Safety None	r:
Military Expended Material	Ingestible Material: None Non-Ingestible Material: Missile booster sections	Military None Recoverable Material			None		
Sonar and Other Transducer Bins	None			-			
Explosive Bins	Land based, various munitions included.						
Procedural Mitigation Measures	Physical Disturbance and S (Section 5.3.4) Vessel movement	Strike Stressors	s:				
Assumptions Used for Analysis	Land based targets only						

A.1.9 SURFACE WARFARE TRAINING

Surface warfare is a type of naval warfare in which aircraft, surface ships, and submarines employ weapons and sensors in operations directed against enemy surface ships or small boats. Aircraft-to-surface warfare is conducted by long-range attacks using air-launched cruise missiles, precision guided munitions, or aircraft guns. Surface warfare also is conducted by warships employing torpedoes, naval guns, and surface-to-surface missiles. Submarines attack surface ships using torpedoes or submarine-launched, anti-ship cruise missiles. Training in surface warfare includes surface-to-surface gunnery and missile exercises, air-to-surface gunnery and missile exercises, and submarine missile or torpedo launch events. Gunnery and missile training generally involves expenditure of ordnance against a towed target. A sinking exercise is a specialized training event that provides an opportunity for ship, submarine, and aircraft crews to use multiple weapons systems to deliver high-explosive ordnance on a deactivated vessel, which is deliberately sunk.

Surface warfare also encompasses maritime security, that is, the interception of a suspect surface ship by a Navy ship for the purpose of boarding-party inspection or the seizure of the suspect ship. Training in these tasks is conducted in visit, board, search and seizure exercises.

A.1.9.1 Bombing Exercise Air-to-Surface

Surface Warfa	re						
	ise Air-to-Surface						
Short	Fixed-wing aircrews delive	r hombs agair	nst 1	ypical Dura	ntion		
Description	surface targets.	DOMES again		1 hour			
Long		t hombing ex			floating targets (e.g., MK-58		
Description	smoke buoy), towed targets, or maneuvering targets. An aircraft clears the area, deploys a smoke buoy, and then delivers high-explosive or non-explosive practice munitions bomb(s) on the target. A range boat may be used to deploy towed or maneuvering targets for an aircraft to attack.						
	Exercises for strike fighters typically involve a flight of two aircraft delivering unguided or guided munitions that may be either high-explosive or non-explosive. The following munitions may be employed by strike fighter aircraft in the course of bombing exercise: Unguided munitions include non-explosive subscale bombs (MK-76 and BDU-45), explosive and non-explosive general purpose bombs (MK-80 series), MK-20 cluster bomb (explosive, non-explosive). Precision-guided munitions include laser-guided bombs (explosive, non-explosive), laser-guided training rounds (non-explosive), Joint Direct Attack Munition (explosive, non-explosive).						
Typical	Platforms: Fixed-wing aircr	aft, support o	craft				
Components	Targets: Surface targets						
	Systems being Trained/Te	sted: Aircraft	platforms, bo	mbs, non-e	explosive practice munitions,		
	targeting lasers						
Standard	Aircraft safety	Typical Loca	ations				
Operating	Weapons firing safety	Danga Cam	mlayas/Tastin	~	Pays /Estuaries /Diagsides		
Procedures	Laser Procedures	Range Com	plexes/Testir	ig	Bays/Estuaries/Pierside: None		
(Section		_	ands Training	and	None		
2.3.3)			dy Area, Prim				
		Special Use		,			
Stressors to	Acoustic:	•	sturbance an	d Strike:	Energy:		
Biological	Vessel noise	-	d aerial target		None		
Resources	Aircraft noise		d in-water dev		Findam allows and		
	Weapons noise	Military exp	pended mate	rials	Entanglement:		
	Explosive:	Ingestion:			None		
	In-water explosions	_	pended mate	rials —			
	iii watei explosions	munitio		ilais			
			oended mate	rials – other			
		than mu					
Stressors to	Air Quality:			and Water	Quality:		
Physical	Criteria air pollutants		Explosives		· •		
Resources	,		Metals				
Stressors to	Cultural Resources:	Socioeco	nomic Resou	rces:	Public Health and Safety:		
Human	Explosives	Accessib			Underwater energy		
Resources	Physical disturbance and	Airborne acoustics In-air energy					
	strike	Physical disturbance and strike Physical interactions					
Military	Ingestible Material:		Military				
Expended	Bomb fragments, target fra	igments	Recoverable	е			
Material	Non-Ingestible Material:		Material				
	_	ine marker.					
	Bomb (non-explosive), marine marker, surface target (stationary)						

Surface Warfai	Surface Warfare							
Bombing Exerc	Bombing Exercise Air-to-Surface							
Sonar and	None							
Other								
Transducer								
Bins								
Explosive	E9	E10	E12	•				
Bins								
Procedural	Explosive Stre	essors: (Section 5.3.3)	=	Physical Disturbance and Strike Stressors:				
Mitigation	Explosive bom	nbs		(Section 5.3.4)				
Measures				Vessel movement				
				Non-explosive bombs and mine shapes				
Assumptions	Explosive bombs are assumed to explode just below the surface.							
Used for	This activity would occur at least 12 NM from land (FDM excepted).							
Analysis								

A.1.9.2 Gunnery Exercise Air-to-Surface Medium-Caliber

Surface Warfai	<u>م</u>					
	ise Air-to-Surface Medium-C	aliher				
Short			madium T	ypical Duration		
Description	Fixed-wing and helicopter aircrews fire medium- caliber guns at surface targets.			hour		
Long				=		
Description	Fighter and helicopter aircrew, engage surface targets with medium-caliber guns. Targets simulate enemy ships, boats, swimmers, and floating/near- surface mines. Fighter aircraft descend on a target firing high-explosive or non-explosive practice munitions medium-caliber projectiles. Helicopters will fly a racetrack pattern around an at-sea target. Aircrew will engage the target with medium-caliber weapons. Targets range from a smoke float, or an empty steel drum, to high speed remote controlled boats and jet-skis.					
Typical Components	Platforms: Fixed-wing aircr Targets: Surface targets Systems being Trained/Te	•				
Standard	Aircraft safety	Typical Loca	ations			
Operating Procedures (Section	Weapons firing safety Target deployment and retrieval safety	Ranges:	plexes/Testin	None	uaries/Pierside:	
2.3.3)		Testing Stu- areas: Spec	dy Area, Prima ial Use Airspa	ary ce		
Stressors to Biological Resources	Acoustic: Vessel noise Aircraft noise Weapons noise Explosive: In-air explosions In-water explosions	Aircraft and Vessels and Military exp Ingestion:	sturbance and d aerial target d in-water dev pended mater pended mater	None ices ials None	y: glement:	
			pended mater unitions	_		
Stressors to Physical Resources	Air Quality: Criteria air pollutants		Sediments : Metals Explosives	and Water Quality:		
Stressors to Human Resources	Cultural Resources: Physical disturbance and strike Explosives	Accessibi Airborne	ility acoustics disturbance a	Underwa Physical i	ealth and Safety: ter energy nteractions	
Military Expended Material	Ingestible Material: Medium-caliber casings, m caliber projectiles Non-Ingestible Material: Marine marker	edium	Military Recoverable Material	Surface target (me stationary)	nobile and	
Sonar and Other Transducer Bins	None					
Explosive Bins	E0 (de minimis), E1, and E2					

Surface Warfai	Surface Warfare					
Gunnery Exerc	Gunnery Exercise Air-to-Surface Medium-Caliber					
Procedural	Explosive Stressors: (Section 5.3.3)	Physical Disturbance and Strike Stressors:				
Mitigation	Explosive medium-caliber and large-caliber	(Section 5.3.4)				
Measures	projectiles	Vessel movement				
		Small-, medium-, and large-caliber non-				
		explosive practice munitions				
Assumptions Used for	Most medium-caliber air-to-surface gunnery exercises will be with non-explosive training projectiles. High-explosive rounds will supplement when non-explosive training projectiles					
Analysis	are not available. Fixed-wing casings remain with aircraft, and helicopter shell casings are expended into the water.					
	This activity occurs greater than 3 NM from la	nd (FDM excepted).				

A.1.9.3 Gunnery Exercise Air-to-Surface Small-Caliber

Surface Warfai	re				
	ise Air-to-Surface Small-Cali	ber			
Short	Helicopter and tilt-rotor air	rcrews. use sr	mall- Tv	pical Duration	
Description	caliber guns to engage surface targets. 1 hour				
Long	Helicopters and tilt-rotor aircraft, fly a racetrack pattern around an at-sea target. Targets				
Description	simulate enemy ships, boats, and floating/near-surface mines. Each gunner will engage the				
	target with small-caliber weapons. Targets range from a smoke float, an empty steel drum, to				
	high speed remote controlled boats and jet-skis.				
Typical	Platforms: Rotary-wing air				
Components				mpty steel drum, high speed remote	
•	controlled boats and jet-sk	_	,	, , , ,	
	Systems being Trained/Te	•	aliber gun syste	ems	
Standard	Aircraft safety	Typical Loca			
Operating	Weapons firing safety				
Procedures	Target deployment and		plexes/Testing	·	
(Section	retrieval safety	Ranges:		None	
2.3.3)	•		inds Training a		
·		_	ly Area, Primar		
			al Use Airspace		
Stressors to	Acoustic:	•	sturbance and		
Biological	Aircraft noise		l aerial target	None	
Resources	Vessel noise		l in-water devi	Entanglement:	
	Weapons noise	Military exp	ended materia	als None	
	Explosive: Ingestion:				
	None	Military exp	ended materia	als –	
		munitio	าร		
		Military exp	ended materi	als – other	
		than mu	nitions		
Stressors to	Air Quality:		Sediments a	nd Water Quality:	
Physical	Criteria air pollutants		Metals		
Resources			_		
Stressors to	Cultural Resources:	Socioeco	nomic Resour		
Human	Physical disturbance and	Accessibi	=	Physical interactions	
Resources	strike		acoustics		
		Physical o	disturbance an		
Military	Ingestible Material:		Military	Surface target (mobile)	
Expended	Small-caliber projectile (no		Recoverable		
Material	explosive), small-caliber ca	sings	Material		
	Non-Ingestible Material:				
	MK 58 marine marker				
Sonar and	None				
Other					
Transducer					
Bins					
Explosive	None				
Bins					

Surface Warfa	Surface Warfare					
Gunnery Exerc	ise Air-to-Surface Small-Caliber					
Procedural	Acoustic Stressors: (Section 5.3.2)	Physical Disturbance and Strike Stressors:				
Mitigation	Weapons firing noise	(Section 5.3.4)				
Measures		Vessel movement				
		Small-, medium-, and large-caliber non-explosive practice munitions				
Assumptions	One target used per event. Expendable smoke float (50 percent), stationary target (45 percent),					
Used for	or remote controlled target (5 percent).					
Analysis	This activity occurs greater than 12 NM	from land.				

A.1.9.4 Gunnery Exercise Surface-to-Surface Boat Medium-Caliber

Surface Warfai	re				
	ise Surface-to-Surface Boat I	Medium-Calib	per		
Short	Small boat crews fire medi	um-caliber gu	ıns at 1	Typical Dura	ation
Description	surface targets.			1 hour	
Long	Small boat crews fire medium-caliber guns at sur			targets. Bo	pat crews may use high or low
Description	speeds to approach and engage targets simulating other boats, floating mines, or nearshore land targets with medium-caliber (up to and including 40 millimeter [mm]) weapons. A commonly used target is an empty steel drum. This event also includes use of anti-swimmer grenades, which may be employed within harbors.				
	A number of different types of boats are used depending on the unit using the boat and their mission. Boats are most used to protect ships in harbors and high value units, such as: aircraft carriers, nuclear submarines, liquid natural gas tankers, etc., while entering and leaving ports, as well as to conduct riverine operations, and various naval special warfare operations. The boats used by these units include small unit river craft, combat rubber raiding craft, rigid-hull inflatable boats, patrol craft, and many other versions of these types of boats. These boats use inboard or outboard, diesel or gasoline engines with either propeller or water jet propulsion.				
Typical	Platforms: Small boat				, , , , , , , , , , , , , , , , , , ,
Components	Targets: Surface targets				
•	Systems being Trained/Tes	sted: Medium	n-caliber gun	systems	
Standard	Vessel safety	Typical Loca	ations		
Operating	Weapons firing safety	Range Com	plexes/Testi	ng	Bays/Estuaries/Pierside:
Procedures	Target deployment and				None
(Section	retrieval safety	Mariana Islands Training and			
2.3.3)		Testing Study Area			
Stressors to	Acoustic:	Physical Di	sturbance an	d Strike:	Energy:
Biological	Vessel noise	Vessels and	d in-water de	vices	None
Resources	Weapons noise	Military exp	pended mate	rials	Entanglement:
	Explosive:	Ingestion:			None
	In-air explosions	_	oended mate	rials –	
	In-water explosions	munitio			
	·	Military exp	oended mate	rials – othe	r
		than mu	ınitions		
Stressors to	Air Quality:		Sediments	and Water	Quality:
Physical	Criteria air pollutants		Explosives		
Resources			Metals		<u>.</u>
Stressors to	Cultural Resources:		nomic Resou	ırces:	Public Health and Safety:
Human	Explosives				Underwater energy
Resources	Physical disturbance and	Airborne acoustics Physical interactions Physical disturbance and strike			
0.01114	strike	Pnysical			
Military Expended	Ingestible Material: Grenade (explosive) fragme	ants	Military Recoverabl		ce target (stationary and bile)
Material	medium-caliber projectiles		Material	le illoi	one)
	explosive), medium-caliber target fragments	casings,			
	Non-Ingestible Material: Surface target (stationary)				

Surface Warfai	re				
Gunnery Exerc	Gunnery Exercise Surface-to-Surface Boat Medium-Caliber				
Sonar and	None				
Other					
Transducer					
Bins					
Explosive	E2				
Bins					
Procedural	Acoustic Stressors: (Section 5.3.2)	Physical Disturbance and Strike Stressors:			
Mitigation Measures	Weapons firing noise Explosive Stressors: (Section 5.3.3) Explosive medium-caliber and large-caliber projectiles Maritime security operations – anti swimmer grenades	(Section 5.3.4) Vessel movement Small-, medium-, and large-caliber non- explosive practice munitions			
Assumptions Used for Analysis	Assume all events include the use of some explosive rounds. Most events will involve boat crews training with MK 203 40 mm grenade launcher. One target used per event, typically a stationary target such as a 50-liter steel drum.				
,	Explosive rounds would be fired greater than 12 NM from land. Non-explosive rounds would be fired greater than 3 NM from land.				

A.1.9.5 Gunnery Exercise Surface-to-Surface Boat Small-Caliber

Surface Warfa	re				
	ise Surface-to-Surface Boat	Small-Calibe			
Short	Small boat crews fire smal			pical Duration	
Description	surface targets.	i-camper guits		our	
-	_	مريح مرداده ا			
Long Description	Small boat crews fire small-caliber guns at surface targets. Boat crews may use high or low speeds to approach and engage targets simulating other boats, swimmers, floating mines, or nearshore land targets with small-caliber (up to and including .50-caliber) weapons. A commonly used target is an empty steel drum.				
	A number of different types of boats are used depending on the unit using the boat and their mission. Boats are most used to protect ships in harbors and high value units, such as: aircraft carriers, nuclear submarines, liquid natural gas tankers, etc., while entering and leaving ports, as well as to conduct riverine operations, and various naval special warfare operations. The boats used by these units include small unit river craft, combat rubber raiding craft, rigid-hull inflatable boats, patrol craft, and many other versions of these types of boats. These boats use inboard or outboard, diesel or gasoline engines with either propeller or water jet propulsion.				
Typical	Platforms: Small Boat				
Components	Targets: Surface Targets				
	Systems being Trained/Te	ested: Small-o	aliber gun syste	ems	
Standard	Vessel safety	Typical Loca	ations		
Operating	Weapons firing safety	Range Com	plexes/Testing	Bays/Estuaries/Pierside:	
Procedures	Target deployment and	Ranges:	pickes/ resting	None	
(Section	retrieval safety	_	ands Training a		
2.3.3)		Testing Stud	_	TIG .	
Stressors to	Acoustic:		sturbance and	Strike: Energy:	
Biological	Vessel noise	-	d in-water devic	<u> </u>	
Resources	Weapons noise		pended materia	als	
				Entanglement:	
	Explosive:	Ingestion:		None	
	In-air explosions		pended materia	als –	
		munitio	-	ala akhan	
			pended materia	ais – otner	
	4' 0 1''	than mu	-	LW . O P	
Stressors to	Air Quality:			nd Water Quality:	
Physical	Criteria air pollutants		Metals		
Resources	0 lt		• •	5 LP 11 III 16 C 1	
Stressors to	Cultural Resources:		nomic Resourc	•	
Human Resources	Physical disturbance and strike	Accessib	acoustics	Physical interactions	
Resources	Strike			d strika	
Military	Physical disturbance and strike Ingestible Material: Military Surface target (mobile and stationary				
Expended	Small caliber projectile (no	n-	Recoverable	Surface target (mobile and stationary	
Material	explosive), small caliber ca		Material		
		0~			
	Non-Ingestible Material: None				
Sonar and	None				
Other	INOTIE				
Transducer					
Bins					
פוווט					

Surface Warfa	Surface Warfare					
Gunnery Exerc	Gunnery Exercise Surface-to-Surface Boat Small-Caliber					
Explosive	None					
Bins						
Procedural	Acoustic Stressors: (Section 5.3.2)	Physical Disturbance and Strike Stressors:				
Mitigation	Weapons firing noise	(Section 5.3.4)				
Measures		Vessel movement				
		Small-, medium-, and large-caliber non-				
		explosive practice munitions				
Assumptions	Events will occur relatively nearshore due to short range of boats and safety concerns. Events					
Used for	mostly occur within 3 nautical miles of the shoreline, but can occur further from shore.					
Analysis						

A.1.9.6 Gunnery Exercise Surface-to-Surface Ship Large-Caliber

Surface Warfa	re				
Gunnery Exerc	ise Surface-to-Surface Ship -	- Large-Caliber			
Short	Surface ship crews fire larg	ge-caliber guns at	Typical Dura	ition	
Description	surface targets.	, 3	Up to 3 hour		
Long Description	This exercise involves ships' gun crews engaging surface targets at sea with their main battery large-caliber (typically 57 millimeter [mm], 76 mm, and 5-inch) guns. Targets include the QST-35 seaborne powered target, high speed maneuverable surface target, or a specially configured remote-controlled water craft. Some targets are expended during the exercise and are not recovered.				
	The exercise proceeds with the target boat approaching from about 10 nautical miles distance. The target is tracked by radar and when within a predetermined range, it is engaged first with large-caliber "warning shots." As threats get closer all weapons may be used to disable the threat.				
	This exercise may involve a larger exercise involving m			the context of a coordinated g exercise.	
	Large-caliber guns will also be fired during weapon certification events and in conjunction with weapon maintenance.				
	During all events, either high-explosive or non-explosive rounds may be used. High-explosiv rounds can either be fused for detonation on impact (with water surface or target), or for proximity to the target (in-air detonation).				
Typical	Platforms: Surface comba	tant			
Components	Targets: Surface targets				
	Systems being Trained/Te	e sted: Large-caliber gun s	systems		
Standard	Vessel safety	Typical Locations			
Operating	Weapons firing safety	Range Complexes/Tes	ting	Bays/Estuaries/Pierside:	
Procedures		Ranges:	tilig	None	
(Section		Mariana Islands Traini	ng and	110110	
2.3.3)		Testing Study Area, Pri	_		
		Special Use Airspace	,		
Stressors to	Acoustic:	Physical Disturbance	and Strike:	Energy:	
Biological	Vessel noise	Vessels and in-water of	devices	In-air electromagnetic	
Resources	Weapons noise	Military expended ma	terials	devices	
	Explosive:	Ingestion:		Entanglement:	
	In-air explosions	Military expended ma	terials –	None	
	In-water explosions	munitions			
		Military expended ma	terials – other		
		than munitions			
Stressors to	Air Quality:	Sedimen	ts and Water	Quality:	
Physical	Criteria air pollutants	Explosive	es		
Resources		Metals			
Stressors to	Cultural Resources:	Socioeconomic Res	ources:	Public Health and Safety:	
Human	Explosives	Accessibility		In-air energy	
Resources	Physical disturbance and	Airborne acoustics		Underwater energy	
	strike	Physical disturbance	e and strike	Physical interactions	

Surface Warfai	re					
Gunnery Exerc	Gunnery Exercise Surface-to-Surface Ship – Large-Caliber					
Military Expended Material	Ingestible Material: Large caliber projectile (explosive) fragments, target fragments	Military Recoverable Material	None			
	Non-Ingestible Material: Large caliber projectile (non- explosive), large caliber casings Surface target (stationary)					
Sonar and Other Transducer Bins	None					
Explosive Bins	E5					
Procedural Mitigation Measures	Acoustic Stressors: (Section 5.3.2) Weapons firing noise Physical Disturbance and Strike Stressors: Explosive Stressors: (Section 5.3.3) Explosive medium-caliber and large-caliber projectiles					
	(Section 5.3.4) Vessel movement Small-, medium-, and large-caliber non- explosive practice munitions					
Assumptions Used for Analysis	For analytical purposes assume all high explosive rounds are fused to detonate upon impact with water surface or target. After impacting the water, the high explosive rounds are expected to detonate within three					
	feet of the surface. Non-explosive round sink to the bottom of the ocean. This activity would occur greater than 12	_				

A.1.9.7 Gunnery Exercise Surface-to-Surface Ship Small- and Medium-Caliber

Surface Warfa	re				
	ise Surface-to-Surface Ship S	mall- and Mo	edium-Caliber		
Short	Surface ship crews fire med			pical Duration	
Description	caliber guns at surface targ				
-	caliber guils at surface targets.			2–3 hours	
Long Description	Ships use small- and medium-caliber weapons to practice defensive marksmanship, typically against a stationary floating target (a 10 foot diameter red balloon [Killer Tomato]) and high speed mobile targets. Some targets are expended during the exercise and are not recovered.				
	Shipboard protection systems (Close-In Weapon System) utilizing medium-caliber projectiles would train against high speed mobile targets.				
Typical Components	Platforms: Small boat, surf Targets: Surface Targets (e Systems being Trained/Te	.g., stationary	y floating targe	t, high speed mobile target) iber gun systems	
Standard	Vessel safety	Typical Loca	ations		
Operating Procedures (Section 2.3.3)	Weapons firing safety Target deployment and retrieval safety	Range Complexes/Testing Ranges: Mariana Islands Training and Testing Study Area, Primary areas: Special Use Airspace			
Stressors to	Acoustic:		sturbance and		
Biological Resources	Vessel noise Weapons noise	Vessels and	d in-water device pended materia	ces In-air electromagnetic	
	Explosive: In-air explosions In-water explosions	munitio	pended materia		
Stressors to	Air Quality:	- triair iric		nd Water Quality:	
Physical Resources	Criteria air pollutant		Explosives Metals	nu water Quanty.	
Stressors to	Cultural Resources:	Socioaco	nomic Resour	ces: Public Health and Safety:	
Human	Explosives	Accessib		In-air energy	
Resources	Physical disturbance and		acoustics	Underwater energy	
	strike		disturbance an		
Military Expended Material	Ingestible Material: Medium-caliber projectiles explosive), medium-caliber (explosive) fragments, small projectile (explosive) fragments caliber projectile (non-explosmall caliber casings, target Non-Ingestible Material: Surface target (stationary)	(non- projectile Il caliber ents, small osive),	Military Recoverable Material	Surface target (mobile) surface target (stationary)	
Sonar and Other Transducer Bins	None				

Surface Warfa	Surface Warfare							
Gunnery Exerc	ise Surface-to-Surface Ship Small- and Medium-Caliber							
Explosive	E1							
Bins								
Procedural	Acoustic Stressors: (Section 5.3.2) Explosive Stressors: (Section 5.3.3)							
Mitigation	Weapons firing noise Explosive medium-caliber and large-caliber							
Measures	Physical Disturbance and Strike Stressors: (Section 5.3.4) Vessel movement Small-, medium-, and large-caliber non-explosive practice munitions							
Assumptions Used for Analysis	One target used per event. Approximately 50 percent of targets are "Killer Tomatoes" (usually recovered). Approximately 35 percent are high-speed maneuvering targets, which are recovered. Approximately 15 percent of targets are other stationary targets such as a steel drum. This activity would occur greater than 12 NM from land (FDM excepted).							

A.1.9.8 Laser Targeting – At-Sea

Surface Warfa	ro						
Laser Targeting							
Short	Fixed-wing and helicopter	aircrows and	<u> </u>	Typical Duration			
Description	shipboard personnel illumi with lasers.		argets	1–2 hours			
Long Description Typical Components	for engagement by aircraft alone or in conjunction wit missiles and guided rocket activity (e.g., air-to-surface Lower powered lasers may operations (force protections). Fixed-wing aircresystem – rotary-wing Targets: Surface targets	may also be used as non-lethal deterrents during maritime security ection). aircraft, rotary-wing aircraft, navy ships and boats, unmanned aerial					
	Systems being Trained/Te			asers			
Standard Operating Procedures (Section	Aircraft safety Unmanned aerial and underwater vehicle procedures	Typical Locations Range Complexes/Testing Bays/Estuaries/Pierside Ranges: None					
2.3.3)	Vessel safety Laser procedures Target deployment and retrieval safety	Mariana Islands Training and Testing Study Area, Primary areas: Special Use Airspace					
Stressors to	Acoustic:	-	sturbance ar	= -			
Biological	Aircraft noise		d aerial targe				
Resources	Vessel noise	Vessel and	in-water dev	ices Entanglement:			
	Explosive: None	Ingestion: None		None			
Stressors to	Air Quality:		Sediments	and Water Quality:			
Physical Resources	Criteria air pollutants		None				
Stressors to	Cultural Resources:	Socioeco	nomic Resou	urces: Public Health and Safety:			
Human	None	Accessibi	-	In-air energy			
Resources		Airborne	acoustics	Physical interactions			
Military Expended Material	Ingestible Material: None Non-Ingestible Material: None	Military Recoverable Material Surface target (mobile)					
Sonar and Other Transducer Bins	None						
Explosive Bins	None						
Procedural Mitigation Measures	Physical Disturbance and S Vessel movement	Strike Stressor	r s: (Section 5				

Surface Warfar	Surface Warfare				
Laser Targeting – At-Sea					
Assumptions	Laser targeting for missile/rocket guidance will occur in areas where these events also occur.				
Used for	Use of lasers as force protection non-lethal deterrents will primarily occur proximate to Navy				
Analysis	homeports.				

A.1.9.9 Maritime Security Operations

Surface Warfare							
Maritime Secu	rity Operations						
Short	Helicopter, surface ship, ar	nd small boat crews	Typical Duration				
Description	conduct a suite of maritime at sea, to include visit, boa seizure, maritime interdicti protection, and anti-piracy	rd, search and ion operations, force	Up to 3 hours				
Long			of maritime security operations (e.g.,				
Description	visit, board, search and seizure, maritime interdiction operations, force protection, and anti-piracy operations). These activities involve training of boarding parties delivered by helicopters and surface ships to surface vessels for the purpose of simulating vessel search and seizure operations. Various training scenarios are employed and may include small arms with non-explosive blanks, explosive Anti-Swimmer Grenades, and surveillance or reconnaissance unmanned surface and aerial vehicles. The entire exercise may last 2–3 hours.						
	Vessel Visit, Board, Search, suspect vessels, potentially		ersonnel from ships and aircraft board ns.				
	Maritime Interdiction Oper ultimately detaining suspec		ft train in pursuing, intercepting, and				
			fense: Naval personnel train to defend ers, and other infrastructure.				
			n in the use of weapons to force fleeing high speeds) to come to a stop.				
		and communicating amo	multiple approaching, circling small craft, ongst crewmates and other vessels to				
	-	udes large vessels (pirat	ersonnel train in deterring and interrupting te "mother ships"), and multiple small,				
Typical Components	unmanned aerial vehicle, u Targets: Surface targets	nmanned surface vehic	aircraft, small boat, surface combatant, cle s, non-lethal deterrents, unmanned systems				
Standard	Vessel safety	Typical Locations					
Operating Procedures (Section 2.3.3)	Aircraft safety Unmanned aerial and underwater vehicle procedures Unmanned surface vehicle safety Laser procedures Target deployment and retrieval safety	Range Complexes/Te Ranges: Mariana Islands Traini Testing Study Area Mariana Islands Range	Apra Harbor ing and				
Stressors to Biological Resources	Acoustic: Aircraft noise Vessel noise	Physical Disturbance Aircraft and aerial tar Vessels and in-water	rget None				

Surface Warfai	re						
Maritime Secu	Maritime Security Operations						
	Weapons noise	Military ex	pended material	S	None		
	Explosive: In-air explosions In-water explosions	Ingestion: Military Ex Munitio	pended Material Ins	s –			
Stressors to	Air Quality:		Sediments and	d Water	Quality:		
Physical Resources	Criteria air pollutants		Explosives	a rrate.	<u></u>		
Stressors to	Cultural Resources:	Socioeco	onomic Resource	es:	Public Health and Safety:		
Human	None	Accessib	ility		In-air energy		
Resources			acoustics		Underwater energy		
		Physical	disturbance and	strike	Lasers		
		-		r	Physical interactions		
Military	Ingestible Material:		Military	None			
Expended	Grenade (explosive) fragme	ents	Recoverable				
Material	Non-Ingestible Material:		Material				
	None						
Sonar and	None						
Other							
Transducer							
Bins							
Explosive Bins	E2						
Procedural	Physical Disturbance and S	trike Stresso	rs: Explosi	ive Stres	ssors: (Section 5.3.3)		
Mitigation	(Section 5.3.4)		-		rity operations – Anti-swimmer		
Measures	Vessel movement			nades			
Assumptions	Maritime Security Operation	ns is a broad	term used to de	scribe ad	ctivities intended train naval		
Used for	forces in the skills necessary to protect naval vessels from small boat attack, counter piracy and						
Analysis	drug operations (maritime interdiction operations and visit, board, search, and seizure), and						
	protect key infrastructure (e.g., oil platforms). Maritime security operations need to remain						
	broad as naval forces need to be able to tailor training events to respond to emergent threats.						
	Maritime Security Operations events typically do not involve live fire of weapons; however, the use of various non-lethal deterrents is likely. All maritime security operations events involve						
	vessel movement, sometim				g around naval vessels), and		
	some event involve helicopt		_		= :		
					uring times of transit in and out		
	of port, as well as during ma			J	and out		
		. ,					

A.1.9.10 Missile Exercise Air-to-Surface

Surface Warfa	' 0						
	e Air-to-Surface (MISSILEX)						
	, ,	- i		······································	-41		
Short Description	Fixed-wing and helicopter			ypical Dura	ation		
•	surface missiles at surface						
Long	_	rcraft, and helicopter aircrews fire precision-guided missiles against					
Description	surface targets. Aircraft inv	volved may b	e unmanned.				
	Fixed-wing aircraft (fighter	ters or maritime patrol aircraft) approach an at-sea surface target fron h high-explosive precision guided missiles.					
	high altitude, and launch h						
	Helicopters designate at-se	ea surface tar	gets with a la	ser or optic	s for a precision guided		
	missiles. Helicopter launch		_	-			
	explosive, detonate at or ju	-		_	, , , , , , , , , , , , , , , , , , ,		
Typical	Platforms: Fixed-wing airc				el		
Components	Targets: Surface targets		,				
	Systems being Trained/Te	sted: Aircraft	platforms				
Standard	Aircraft safety	Typical Loc	ations				
Operating	Laser procedures	Pango Com	plexes/Testin	ν σ	Bays/Estuaries/Pierside:		
Procedures	Weapons firing safety	Ranges:	piexes/ restin	ıg	None		
(Section	Target deployment and	_	ands Training	and	None		
2.3.3)	retrieval safety		dy Area, Prima				
		Special Use	-	ary areas.			
Stressors to	Acoustic:		sturbance an	d Strike:	Energy:		
Biological	Vessel noise	=	d in-water dev		In-air electromagnetic		
Resources	Aircraft noise	Aircraft an	d aerial target	t	devices		
	Weapons noise	Military ex	pended matei	rials	Entanglement:		
	Explosive:	Ingestion:			None		
	In-air explosions	-	pended mate	rials –			
	In-water explosions	munitio					
	·	Military ex	pended matei	rials – othe	r		
		than mu	unitions				
Stressors to	Air Quality:		Sediments	and Water	Quality:		
Physical	Criteria air pollutants		Explosives	C	Chemicals		
Resources			Metals				
Stressors to	Cultural Resources:		onomic Resou	irces:	Public Health and Safety:		
Human	Explosives	Accessib	•		Underwater energy		
Resources	Physical disturbance and		acoustics		In-air energy		
	strike	Physical	disturbance a		Physical interactions		
Military	Ingestible Material:		Military		e target (mobile and		
Expended	Missile (explosive) fragmer	its, target	Recoverable	e station	nary)		
Material	fragments		Material				
	Non-Ingestible Material:						
	None						
Sonar and	None						
Other							
Transducer							
Bins							
Explosive	E6 E8	E1	LU				
Bins							

Surface Warfai	Surface Warfare							
Missile Exercis	Missile Exercise Air-to-Surface (MISSILEX)							
Procedural Mitigation	Acoustic Stressors (Section 5.3.2) Weapons firing noise	Explosive Stressors: (Section 5.3.3) Explosive missiles and rockets						
Measures	Physical Disturbance and Strike Stressors: (Section 5.3.4) Non-explosive missiles and rockets							
Assumptions	Assume one missile and one target per event.							
Used for	While missiles could explode above the water's surface after contacting targets, analysis							
Analysis	assumes all warheads explode at or just below the water's surface.							
	Targets are usually recovered but could be lost due to damage.							
	This activity occurs greater than 12 NM fr	om land (FDM excepted).						

A.1.9.11 Missile Exercise Air-to-Surface – Rocket

Surface Warfa	re					
	e Air-to-Surface – Rocket					
		.1	-			
Short	Helicopter aircrews fire bo	-		oical Dura Iour	ition	
Description	and unguided rockets at su					
Long			-	•	otics for precision-guided high	
Description	explosive or non-explosive practice munitions rockets. Unguided rockets may also be used					
	during this event.					
Typical	Platforms: Fixed-wing airc	raft, rotary-w	ing aircraft, su	pport ves	sel, unmanned aerial system -	
Components	rotary wing					
	Targets: Surface targets					
	Systems being Trained/Te	sted: Aircraft	platforms			
Standard	Aircraft safety	Typical Loca	ations			
Operating	laser safety				- / /	
Procedures	Weapons firing safety	_	plexes/Testing		Bays/Estuaries/Pierside:	
(Section	Laser procedures	Ranges:			None	
2.3.3)	Unmanned aerial and		ands Training a			
,	underwater vehicle	_	dy Area, Primar	-		
	procedures	areas: Spec	ial Use Airspace	9		
	Target deployment and					
	retrieval safety					
Stressors to	Acoustic:	Physical Di	sturbance and	Strike:	Energy:	
Biological	Vessel noise		d in-water devi		In-air electromagnetic	
Resources	Aircraft noise		d aerial target		devices	
1100001000	Weapons noise		pended materia	als	Lasers	
	-				Entanglement:	
	Explosive:	Ingestion:			None	
	In-air explosions	-	pended materia	als –		
	In-water explosions	munitio				
			pended materia	als – othe	r	
		than mu				
Stressors to	Air Quality:		Sediments a			
Physical	Criteria air pollutants		Explosives	C	hemicals	
Resources			Metals			
Stressors to	Cultural Resources:	Socioeco	nomic Resour	ces:	Public Health and Safety:	
Human	Explosives	Accessib	•		Underwater energy	
Resources	Physical disturbance and		acoustics		In-air energy	
	strike	Physical	disturbance an	d strike	Physical interactions	
Military	Ingestible Material:		Military	Surface	e target (mobile and stationary)	
Expended	Rocket (explosive) fragmer	nts, target	Recoverable			
Material	fragments		Material			
	Non-Ingestible Material:					
	_	ket (non-				
	explosive)	Mk 58 marine marker, rocket (non-				
Sonar and	None					
	INUITE					
Other Transducer						
Bins						
	F2					
Explosive	E3					
Bins						

Surface Warfa	Surface Warfare						
Missile Exercis	e Air-to-Surface – Rocket						
Procedural	Acoustic Stressors (Section 5.3.2)	Explosive Stressors: (Section 5.3.3)					
Mitigation	Weapons firing noise	Explosive missiles and rockets					
Measures	Physical Disturbance and Strike Stresson (Section 5.3.4) Non-explosive missiles and rockets	ors:					
Assumptions	Assume all explosive rockets detonate i	n water					
Used for	Rockets may be used in conjunction with force protection events.						
Analysis	The in-air low energy laser stressor was used in analysis of potential impacts on human resources.						
	Targets are usually recovered but could be lost due to damage.						
	This activity would occur greater than 1	2 NM from land (FDM excepted).					

A.1.9.12 Missile Exercise Surface-to-Surface

Surface Warfa	re					
Missile Exercis	e Surface-to-Surface					
Short	Surface ship crews defend	against surface	Typical Dura	tion		
Description	threats (ships or small boa with missiles.	ts) and engage them	2–5 hours			
Long Description	Surface ships launch missiles at surface maritime targets with the goal of destroying disabling enemy ships or boats.					
	After detecting and confirr missile.	ning a surface threat, th	ne ship will fire	a precision guided surface		
	Events with destroyers and similar) surface missiles. We requirement exists for non target is unavailable, a tow	hile past Harpoon even -sinking exercise events	ts occurred du to certify ship			
		nd Griffin. Events with li	ttoral combat a	ve shorter range surface and patrol combatant ships than 10 miles) surface threats.		
	These exercises are live fire be equipped with either hi			range. Surface missiles could		
Typical	Platforms: Surface combat	<u> </u>	JIOSIVE Warried	u3.		
Components	Targets: Surface targets Systems being Trained/Te					
Standard	Vessel safety	Typical Locations				
Operating Procedures (Section 2.3.3)	Weapons firing safety Target deployment and retrieval safety	Range Complexes/Te Ranges: Mariana Islands Train Testing Study Area, Pi Special Use Airspace	ing and	Bays/Estuaries/Pierside: None		
Stressors to Biological Resources	Acoustic: Vessel noise Weapons noise	Physical Disturbance Vessels and in-water Military expended ma	devices	Energy: In-air electromagnetic devices		
	Explosive: In-air explosions In-water explosions	Ingestion: Military expended manunitions Military expended manunitions		Entanglement: None		
Stressors to Physical Resources	Air Quality: Criteria air pollutants	Explosiv Metals		hemicals		
Stressors to Human Resources	Cultural Resources: Explosives Physical disturbance and strike	Socioeconomic Re Accessibility Airborne acoustics Physical disturbance		Public Health and Safety: In-air energy Underwater energy Physical interactions		

Surface Warfa	Surface Warfare							
Missile Exercis	xercise Surface-to-Surface							
Military	Ingestible Material: Military Surface target (mobile and							
Expended	Missile (explosive) fragments, target	Recoverable	stationary)					
Material	fragments	Material						
	Non-Ingestible Material:							
	None							
Sonar and	None							
Other								
Transducer								
Bins								
Explosive	E6 E10							
Bins								
Procedural	Acoustic Stressors (Section 5.3.2)							
Mitigation	Weapons firing noise							
Measures	Physical Disturbance and Strike							
	Stressors(Section 5.3.4)							
	Vessel movement							
	Explosive Stressors (Section 5.3.3)							
	Explosive missiles and rockets							
Assumptions	Assume one missile and one target used	per event.						
Used for	While missile could explode above wate	r's surface after	contacting target, analysis assumes all					
Analysis	warheads explode at or just below surfa	ce.						
	Targets are usually recovered but could be lost due to damage.							
	This activity would occur greater than 50	NM from land (FDM excepted).					

A.1.9.13 Sinking Exercise

Surface Warfa	re			
Sinking Exercis				
Short		no crows dolihoratoly	Typical Dura	ation
Description	sink a seaborne target, usually a decommissioned ship made environmentally			
	safe for sinking according t Protection Agency standard ordnance.		4–8 hours, p	oossibly over 1–2 days
Long	Ship personnel and aircrew	deliver high-explosive	ordnance on a	seaborne target, (large
Description	deactivated vessel), which			
	exercise is typically conduct ordnance delivery on a full		essels, and su	ubmarines to train in live
	The target is typically a dec	commissioned ship made	e environmen	tally safe for sinking according
	to U.S. Environmental Prot miles from shore and in wa			n is greater than 50 nautical .).
	Ship, aircraft, and submari	ne crews attack with coo	ordinated tact	ics and deliver a variety of inert
				8 hours and possibly over 1 to
	2 days; however, it is unpre	•		
Typical	Platforms: Fixed-wing aircr	aft, submarines, suppor	t craft, surfac	e combatant
Components	Targets: Ship hulk	aka da Laura a a Dhan an ann		
		_	systems, missi	le systems, bombs, torpedoes,
Chandand	small-caliber gun systems,			
Standard	Vessel safety	Typical Locations		
Operating Procedures	Aircraft safety Weapons firing safety	Range Complexes/Tes	ting	Bays/Estuaries/Pierside:
(Section	Sinking exercise safety	Ranges:		None
2.3.3)	Siliking exercise safety	Mariana Islands Traini	ng and	
2.3.3)		Testing Study Area		
Stressors to	Acoustic:	Physical Disturbance	and Strike:	Energy:
Biological	Aircraft noise	Aircraft and aerial tar	get	In-air electromagnetic
Resources	Vessel noise	Vessels and in-water of	devices	devices
	Weapons noise	Military expended ma	terials	Entanglement:
	Explosive:	Seafloor devices		Wires and cables
	In-air explosions	Ingestion:		
	In-water explosions	Military expended ma	terials –	
	i '	munitions		
		Military expended ma	terials – othe	r
		than munitions		
Stressors to	Air Quality:	Sedimer	ts and Water	Quality:
Physical	Criteria air pollutants	Explosive		Chemicals
Resources		Metals		
Stressors to	Cultural Resources:	Socioeconomic Res	ources:	Public Health and Safety:
Human	Explosives	Accessibility		In-air energy
Resources	Physical disturbance and	Airborne acoustics		Underwater energy
	strike	Physical disturbance	e and strike	Physical interactions

Surface Warfare						
Sinking Exercis	e					
Military Expended Material	Ingestible Material: Bomb (explosive) fragments, heavyweight torpedo (explosive) fragments, large caliber projectile (explosive) fragments, missile (explosive) fragments, small caliber projectile (non-explosive), small caliber casings Non-Ingestible Material: Ship hulk, heavyweight torpedo accessories, guidance wire, large caliber projectile (non-explosive), large caliber casings	Military Recoverable Material	None			
Sonar and Other Transducer Bins	Torpedoes: TORP2					
Explosive Bins	E5 E8 E1	0	E11	E12		
Procedural Mitigation Measures	Acoustic Stressors: (Section 5.3.2) Weapons firing noise Physical Disturbance and Strike Stressors: (Section 5.3.4) Vessel movement Explosive Stressors: (Section 5.3.3) Sinking Exercises					
Assumptions Used for Analysis	Events occur greater than 50 nautical miles from shore and in water depths greater than 6,000 ft. during daylight hours only. The participants and assets typically include: 1 full-size target ship hulk 1–5 CG, DDG, or LCS ships 1-10 Fixed-wing aircraft (e.g., F/A-18, or maritime patrol aircraft) 1 or 2 MH-60 helicopters 1 E-2 aircraft for Command and Control 1 submarine 1–3 range clearance aircraft For purposes of analysis, the below represents the types of munitions that might be employed. Actual SINKEX ordnance expenditures will vary. 1–2 Harpoon surface-to-surface or air-to-surface missiles 2–4 Maverick or Hellfire air-to-surface missiles 2–12 MK-80 series general purpose bombs 200 rounds large-caliber projectiles 1–2 MK-48 heavyweight submarine-launched torpedo Assume 2 guidance wires expended per event Acoustic effects modeling assumed only a percentage of munitions missed target and exploded in water. Precision guided munitions are assumed to impact target well above waterline and are not modeled (or reported) as in water explosions.					

A.1.10 OTHER TRAINING EXERCISES

A.1.10.1 Direct Action (Tactical Air Control Party)

Other Training	Exercises							
	Tactical Air Control Party)							
Short	Military personnel train for	r controlling	of	Typical D	Ouration			
Description	combat support aircraft; p							
	confliction and terminal co	ontrol for Clo	se Air	Multiple	days			
	Support.							
Long	Tactical Air Control person	nel, once at I	Farallon de	Medinilla	, participate in tactical air control			
Description				_	issile exercise, They may also			
		employ small arms, grenades, mortars, and crew served weapons in direct action against						
	targets on the island.							
Typical	Platforms: Fixed-wing airc	raft, rotary-w	ing aircraft	, small bo	ats			
Components	Targets: None		1.1					
a	Systems being Trained/Te			as, explos	sive grenades and mortars			
Standard	Aircraft safety	Typical Loca	ations					
Operating Procedures	Vessel safety Laser procedures	Range Com	plexes/Tes	ting	Bays/Estuaries/Pierside:			
(Section	Target Deployment and	Ranges:			None			
2.3.3)	Retrieval Safety	Farallon de	Medinilla					
2.3.3)	Farallon de Medinilla							
	Access Restrictions							
Stressors to	Acoustic:	Physical Di	sturbance a	and Strike	: Energy:			
Biological	Aircraft noise		Aircraft and aerial targets None					
Resources	Vessel noise	Vessel and			Entanglament			
	Explosive:	Ingestion:			Entanglement: None			
	None	None			None			
Stressors to	Air Quality:		Sedimen	ts and Wa	iter Quality:			
Physical	Criteria air pollutants		None					
Resources	,							
Stressors to	Cultural Resources:	Socioeco	nomic Res	ources:	Public Health and Safety:			
Human	None	None			None			
Resources								
Military	Ingestible Material:		Military	No	ne			
Expended	None		Recoveral	ble				
Material	Non-Ingestible Material:		Material					
	None							
Sonar and	None							
Other								
Transducer								
Bins								
Explosive	None							
Bins								
Procedural	Physical Disturbance and S	strike Stresso	ors: (Section	5.3.4)				
Mitigation Measures	Vessel movement							
	May involve aversight as as	ning on FDM	1					
Assumptions Used for	May involve overnight cam	אומ אווים אווים	ı .					
Analysis								
Allalysis								

A.1.10.2 Intelligence, Surveillance, Reconnaissance

Other Training	Evercises					
_	urveillance, Reconnaissance					
Short			wietield	Tunio	al Dura	lion.
Description	Personnel train to collect a	na report ba	ttierieid		al Durat	
-	intelligence.		- l + + - f ' - -		iple days	
Long					-	s, and gather intelligence. For
Description	training of assault forces, "					
	permitted a period of time force.	to conduct s	urveillance	and pr	epare o	erenses to the assaulting
Tourisal		aft anallha			:-!	una a contra
Typical	Platforms: Fixed-wing aircr	ratt, small bo	at, unmann	ea aer	iai syste	ms, submarines
Components	Targets: None	eted. None				
6	Systems being Trained/Te					
Standard	Aircraft safety	Typical Loc	ations			
Operating	Unmanned Aerial and	Range Com	plexes/Test	ting		Bays/Estuaries/Pierside:
Procedures (Section	Underwater Vehicle Procedures	Ranges:				None
(Section		Mariana Isla	ands Range	Comp	lex;	
2.3.3)	Vessel safety	Guam; Tinia	an; Rota; Sa	ipan		
Stressors to	Acoustic:	Physical Di	sturbance a	and St	rike:	Energy:
Biological	Aircraft noise	Aircraft an	d aerial targ	gets		None
Resources	Vessel noise	Vessel and	in-water de	evices		Entanglement:
	Explosive:	Ingestion:				Decelerator/parachute
	None	_	pended mat	torials	_ other	• •
	None	=	-	teriais	other	vvii es ana cables
Stressors to	Air Quality:	than munitions Sediments and Water Quality:				
Physical	Criteria air pollutants		None	ts and	water	Quanty.
Resources	Criteria dii poliatarits		None			
Stressors to	Cultural Resources:	Socioeco	nomic Res	ources		Public Health and Safety:
Human	None	Accessib		ouices		Physical interactions
Resources			acoustics			, c.cac.
			disturbance	e and s	trike	
Military	Ingestible Material:	· · · · · · · · · · · · · · · · · · ·	Military		None	
Expended	Decelerator/parachute		Recovera	ble		
Material	Non-Ingestible Material:		Material			
	Sonobuoys (non-explosive)	, sonobuoy				
	wires	•				
Sonar and	None					
Other						
Transducer						
Bins						
Explosive	None					
Bins						
Procedural	Physical Disturbance and S	trike Stresso	rs: (Section	5.3.4)		
Mitigation	Vessel movement					
Measures						
Assumptions	None					
Used for						
Analysis						

A.1.10.3 Precision Anchoring

Other Training	Exercises					
Precision Anch						
Short Description	Surface ship crews release in designated locations.				cal Duration o 1 hour	
Long Description	Ship crews choose the best available anchoring sites. The ship uses all means available to determine its position when anchor is dropped to demonstrate calculating and plotting the anchor's position within 100 yards of center of planned anchorage.					
Typical Components	Platforms: Navy Ships Targets: None Systems being Trained/Tested: None					
Standard	Vessel safety	Typical Loca	itions			
Operating Procedures (Section 2.3.3)	Target deployment and retrieval safety	Range Complexes/Testing Ranges: Mariana Islands anchorages			Bays/Estuaries/Pierside: Apra Harbor	
Stressors to Biological Resources	Acoustic: Vessel noise Explosive: None	Physical Disturbance and Strike: Vessels and in-water devices Seafloor devices Ingestion: None			= -	
Stressors to Physical Resources	Air Quality: Criteria air pollutants	Sediments and Water Quality: Chemicals Other materials				
Stressors to Human Resources	Cultural Resources: Physical disturbance and strike	Accessibi	nomic Resolity disturbance		Physical interactions	
Military Expended Material	Ingestible Material: None Non-Ingestible Material: None		Military Recoveral Material	ble	Anchors	
Sonar and Other Transducer Bins	None					
Explosive Bins	None					
Procedural Mitigation Measures	Physical Disturbance and S Vessel movement	trike Stressor	rs: (Section	5.3.4,)	
Assumptions Used for Analysis	None					

A.1.10.4 Search and Rescue At Sea

Other Training	Evereises					
Search and Res						
Short				Funcional Duna	tion.	
Description	Helicopter and ship crews	rescue militar	•	Typical Dura		
•	personner at sea.	personnel at sea. Up to 3 days				
Long Description	Helicopter, ship, and submarine crews practice the skills required to recover personnel lost at sea. Helicopters locate survivors and deploy rescue swimmer and rescue basket. Survivors are winched up to the hovering helicopter. Surface ships would conduct man overboard drills and deploy a dummy figure in the water. Ship crews would launch a small boat, direct the recovery of the dummy, and recover the small boat. Submarine crews would maneuver submarine to effect recovery of personnel.					
Typical Components	Platforms: Fixed-wing airco Targets: None Systems being Trained/Te	•	ing aircraft, s	urface ships	, unmanned aerial vehicles	
Standard	Aircraft safety	Typical Loca	ations			
Operating Procedures	Unmanned Aerial and Underwater Vehicle	Range Com	plexes/Testir	ng	Bays/Estuaries/Pierside:	
(Section	Procedures	Ranges:			Apra Harbor and Mariana	
2.3.3)	Vessel safety	Mariana Isla Study Area	ands Test and	l Training	littorals	
Stressors to	Acoustic:	Physical Di	sturbance an	d Strike:	Energy:	
Biological	Aircraft noise	Aircraft and	d aerial target	ts	None	
Resources	Vessel noise	Vessel and	in-water devi	ices	Entanglement:	
	Explosive:	Military ex	pended mate	rials	None	
	None	Ingestion:			None	
		None				
Stressors to	Air Quality:		Sediments	and Water	Ouality:	
Physical	Criteria air pollutants		None			
Resources	'					
Stressors to	Cultural Resources:	Socioeco	nomic Resou	ırces:	Public Health and Safety:	
Human	None	Accessib	ility		Physical interactions	
Resources		Airborne	acoustics			
		Physical	disturbance a	and strike		
Military	Ingestible Material:		Military	None		
Expended	None		Recoverable	е		
Material	Non-Ingestible Material:		Material			
	None					
Sonar and	None					
Other	None					
Transducer						
Bins						
Explosive	None					
Bins						
Procedural	Physical Disturbance and S	Strike Stresso	rs: (Section 5.	.3.4)		
Mitigation	Vessel movement		•	•		
Measures						
Assumptions	None					
Used for						
Analysis						

A.1.10.5 Small Boat Attack

Other Training Ex	vercises				
Small Boat Attac					
Short	Afloat units defend against	cmall hoat o	r	Typical D	uration
Description	personal water craft attack		' F	6 hours	uration
•	•		or porconal		t conduct attack activities on units
Long Description			-		k in harbors, restricted channels,
Description	and nearshore areas using	•			
	location.	non-iethai in	cans or arm	ament app	propriate to the threat and
Typical	Platforms: Small boat, unm	nanned surfa	sa vahicla s	hins	
Components	Targets: Surface targets	iaimea sarra	de vernicie, s	iliba	
components	Systems being Trained/Te	sted: None			
Standard	Vessel safety	Typical Loca	ations		
Operating	Unmanned Aerial and				- / /-:
Procedures	Underwater Vehicle	_	plexes/Test	ing	Bays/Estuaries/Pierside:
(Section 2.3.3)	Procedures	Ranges:	anda Taribata		Apra Harbor and Mariana
	Target deployment and		ands Trainin	g and	littorals
	retrieval safety	Testing Stud	ay Area		
Stressors to	Acoustic:	Physical Di	sturbance a	nd Strike:	Energy:
Biological	Vessel noise	Vessel and	in-water de	vices	None
Resources	Explosive:	Military ex	pended mat	erials	Entanglement:
	None	Ingestion:			None
	None	_	pended Mat	erials –	None
		Munitio			
		Military Ex	pended Mat	erials – Ot	ther
		than mu			
Stressors to	Air Quality:	-	Sediment	s and Wat	ter Quality:
Physical	Criteria air pollutants		Metals		
Resources					
Stressors to	Cultural Resources:	Socioeco	nomic Resc	urces:	Public Health and Safety:
Human	None	Accessib	ility		Physical interactions
Resources		Airborne	acoustics		In-air energy
		Physical	disturbance	and strike	2
Military	Ingestible Material:		Military	Surf	face target (stationary)
Expended	Small caliber projectile (nor		Recoverab	ole	
Material	explosive), small caliber cas	ings, small	Material		
	caliber blanks				
	Non-Ingestible Material:				
	None				
Sonar and	None				
Other					
Transducer					
Bins					
Explosive Bins	None				
Procedural	Physical Disturbance and S	trike Stresso	rs: (Section .	5.3.4)	
Mitigation	Vessel movement		•	•	

Other Training E	Other Training Exercises			
Small Boat Attack				
Assumptions				
Used for				
Analysis				

A.1.10.6 Submarine Navigation

Other Training	Exercises					
Submarine Nav						
Short	Submarine crews operate s	sonar for navig	ation	Турі	ical Dura	ition
Description	and detection while transiting into and out of port during reduced visibility.					
				Up to 2 hours		
Long	Submarine crews train to o	perate sonar f	or navigat	ion. T	he abilit	ry to navigate using sonar is
Description	critical for detection while	transiting into	and out o	f port	t during	periods of reduced visibility.
	During this activity the sub	marine will be	surfaced.			
Typical	Platforms: Submarines					
Components	Targets: None					
	Systems being Trained/Te	sted: High-freq	uency sor	nar, n	ոid-frequ	iency sonar (hull-mounted)
Standard	Vessel safety	Typical Locat	ions			
Operating		Range Comp	lexes/Tes	ting		Bays/Estuaries/Pierside:
Procedures		Ranges:	icacs, ics	· · · · · · · · · · · · · · · · · · ·		Apra Harbor and Mariana
(Section		Mariana Isla	nds Traini	ng an	d	littorals
2.3.3)		Testing Stud			-	
Stressors to	Acoustic:	Physical Dist		and S	trike:	Energy:
Biological	Sonar and other	Vessels and i				None
Resources	transducers					Fortage description
	Fundanius.	Ingestion:				Entanglement:
	Explosive: None	None				None
Stressors to	Air Quality:		Sedimen	tc and	d Water	Quality:
Physical	None		None	ts and	u watei	Quanty.
Resources	TVOITE		None			
Stressors to	Cultural Resources:	Socioecon	omic Res	ource	es:	Public Health and Safety:
Human	None	Accessibili				Physical interactions
Resources		Airborne a	coustics			Underwater energy
		Physical di	isturbance	e and	strike	
Military	Ingestible Material:		Military		None	
Expended	None		Recovera	ble		
Material	Non-Ingestible Material:		Material			
	None					
Sonar and	High Frequency:	Mid-Freq	nency.		<u></u>	
Other	HF1	MF3	uccy.			
Transducer						
Bins						
Explosive	None	.				
Bins						
Procedural	Acoustic Stressors: (Section	n 5.3.2)	P	hysica	al Distur	bance and Strike Stressors:
Mitigation	Active sonar			(Se	ction 5.3	.4)
Measures			V	essel	moveme	ent

Other Training Exercises				
Submarine Navigation				
Assumptions	None			
Used for				
Analysis				

A.1.10.7 Submarine Sonar Maintenance

Other Training	Exercises					
	nar Maintenance					
Short	Maintenance of submarine	sonar and ot	her	Typic	cal Duration	
Description	system checks are conducted pierside or at sea.			Up to 1 hour		
Long	•	-			BQQ-10 and submarine high-frequency	
Description					ct maintenance to their sonar systems in	
•	T				ntenance could occur anywhere as the	
	system's performance may	-			ŕ	
Typical	Platforms: Submarines					
Components	Targets: None					
	Systems being Trained/Te	sted: Mid-fred	quency hull	mour	nted sonar	
Standard	Vessel safety	Typical Loca	tions			
Operating	Pierside testing safety	Range Comp	alovos/Tost	ing	Bays/Estuaries/Pierside:	
Procedures		Ranges:	JICACS/ ICSC	Б	Apra Harbor and Mariana	
(Section		Mariana Isla	nds Trainin	g and	•	
2.3.3)		Testing Stud		0		
			•			
Stressors to	Acoustic:	Physical Disturbance and Strike:			rike: Energy:	
Biological	Sonar and other	Vessels and	in-water d	evices	s None	
Resources	transducers	Ingestion:			Entanglement:	
	Explosive:	None			None	
	None					
Stressors to	Air Quality:	<u>-</u>	Sediment	ts and	l Water Quality:	
Physical	None		None		•	
Resources						
Stressors to	Cultural Resources:	Socioeco	nomic Resc	ources	s: Public Health and Safety:	
Human	None	Airborne	acoustics		Underwater energy	
Resources						
Military	Ingestible Material:		Military		None	
Expended	None		Recoverab	ble		
Material	Non-Ingestible Material:		Material			
	None					
Sonar and	Mid-Frequency:			•		
Other	MF3					
Transducer						
Bins						
Explosive	None					
Bins						
Procedural	Acoustic Stressors: (Section	n 5.3.2)	Ph	-	l Disturbance and Strike Stressors:	
Mitigation	Active sonar				ction 5.3.4)	
Measures			Ve	essel r	movement	
Assumptions	Conducted at pier or while	underway				
Used for						
Analysis						

A.1.10.8 Surface Ship Sonar Maintenance

Other Training	Evereises						
	onar Maintenance						
Short			-464	Treni	ical Duration		
Description	Maintenance of surface shi	-			ical Duration		
	system checks are conduct			_	to 4 hours		
Long			• .		lic maintenance to the AN/SQS-53 sonar		
Description		-			tenance takes up to four hours. Surface		
	ships operate active sonar systems for maintenance while in shallow water near their homeport,						
Typical	however, sonar maintenance could occur anywhere as the system's performance may warrant. Platforms: Surface combatant						
Components	Targets: None	ant					
Components	Systems being Trained/Te	sted: Mid-fre	quency hull	mou	inted		
Standard	Vessel safety	Typical Loca	-	mou	inted		
Operating	Pierside testing safety				- 1- 1- 1- 1-		
Procedures		_	plexes/Testi	ıng	Bays/Estuaries/Pierside:		
(Section		Ranges:	ands Training	~ ~ ~ ~	Apra Harbor and Mariana d littorals		
2.3.3)		Testing Stud		gano	a littorals		
Stressors to	Acoustic:		sturbance a	nd St	trike: Energy:		
Biological	Sonar and other	-	d in-water de				
Resources	transducers				devices		
	Vessel noise	Ingestion:			Futou alous out.		
	Explosive:	None			Entanglement: None		
	None				NOTIC		
Stressors to	Air Quality:	-	Sediment	s and	d Water Quality:		
Physical	Criteria air pollutants		None		a trate. Quanty.		
Resources							
Stressors to	Cultural Resources:	Socioeco	nomic Reso	urce	s: Public Health and Safety:		
Human	None	None			Underwater energy		
Resources							
Military	Ingestible Material:		Military		None		
Expended	None		Recoverab	ole			
Material	Non-Ingestible Material:		Material				
	None						
Sonar and	Mid-Frequency:				1		
Other	MF1						
Transducer							
Bins							
Explosive	None						
Bins							
Procedural	Acoustic Stressors: (Section	n 5.3.2)	Ph	ysica	al Disturbance and Strike Stressors:		
Mitigation	Active sonar			•	ction 5.3.4)		
Measures			Ve	sselı	movement		
Assumptions	Conducted at pier or while	underway					
Used for							
Analysis							

A.1.10.9 Underwater Survey

Other Training	Exercises						
Underwater Si							
Short	Navy divers train in survey	of underwate	r T	ypical Dur	ration		
Description	conditions and features in			710000 = 000			
•	insertion, extraction, or int	•		hours			
	surveillance, and reconnais	_					
Long				and a repo	ort of findings to provide precise		
Description					al reconnoitering of beaches and		
·	surf conditions during the	day and night to find and clear underwater obstacles and determine					
	the feasibility of landing ar	n amphibious f	orce on a pa	rticular be	ach.		
Typical	Platforms: Small boats						
Components	Targets: None						
	Systems being Trained/Te	sted: None					
Standard	Vessel safety	Typical Loca	tions				
Operating		Range Comp	lexes/Testin	ng	Bays/Estuaries/Pierside:		
Procedures		Ranges:	,	ъ	Apra Harbor and Mariana		
(Section		_	nds Training	and	littorals		
2.3.3)		Testing Stud	_				
Stressors to	Acoustic:	·	turbance an	d Strike:	Energy:		
Biological	Vessel noise	-	n-water devi		None		
Resources	Form to above				Fotos elements		
	Explosive: None	Ingestion: None			Entanglement: None		
Chunnana ta		None	Cadinaanta	NA/			
Stressors to Physical	Air Quality: Criteria air pollutants		Sediments None	and wate	r Quality:		
Resources	Criteria ali poliutarits		None				
Stressors to	Cultural Resources:	Socioeco	nomic Resou	rces:	Public Health and Safety:		
Human	None	Accessibil			Physical interactions		
Resources			listurbance a	nd strike	,		
Military	Ingestible Material:	· 1	Military	None			
Expended	None		Recoverable				
Material	Non to a still a Rankovick		Material				
	Non-Ingestible Material: None						
Sonar and	None						
Other							
Transducer							
Bins	Nana						
Explosive	None						
Bins	Dhysical District 10	Autha Carrer	(Coot! T	2.41			
Procedural Mitigation	Physical Disturbance and S	trike Stressor	s: (Section 5.	3.4)			
Mitigation Measures	Vessel movement						
	Hand hold (or similar) do n	ninimic conor c	ources may	ho usad D	uring the conduct of underwater		
Assumptions Used for	survey activities personnel				Ouring the conduct of underwater		
Analysis	Janvey activities personner	may stanta iii	are suri zulle	, and walk	onto the beach.		
Allalysis	l						

A.1.10.10 Unmanned Aerial Vehicle Training and Certification

Other Training	Exercises				
	rial System Training and Cer	tification			
Short	Units conduct training with	n unmanned a	erial T	ypical Duratio	on
Description	vehicles from a variety of p		ıding		
	surface ships and submarir	nes.		2 days	
Long	Conduct unmanned aerial	vehicle activity in support of tactical and theater requirements.			theater requirements.
Description	During training nersonnel	use radio frequency communications to control and communicate			
	with the unmanned aerial			arrications to	control and communicate
Typical	Platforms: Submarines, su			ıl system-fixed	wing
Components	Targets: Land targets, surfa	-		,	J
	Systems being Trained/Te	sted: None			
Standard	Aircraft safety	Typical Loca	itions		
Operating	Unmanned aerial and	Range Com	plexes/Testin	g Ranges:	Bays/Estuaries/Pierside:
Procedures	underwater vehicle		nds Training		None
(Section	procedures	Study Area			
2.3.3)	Vessel safety		nds Range Co	mplex	
		airfields (Or	ote Point Airf	ield, Guam;	
		Northwest Airfield, Guam; North Airfield, Tinian)			
_		Mariana Islands Special Use Airspace			
Stressors to	Acoustic:	Physical Disturbance and Strike:		Energy:	
Biological	Vessel noise	Aircraft and aerial targets None			None
Resources	Explosive:	Military expended materials Vessel and in-water devices Entanglement:			Entanglement:
	None	Ingestion:			None
Stressors to	Air Ovolity	None Sediments and Water Quality:			·alit
Physical	Air Quality: Criteria air pollutants		None	and Water Qt	ianty:
Resources	Criteria dii poliditarits		None		
Stressors to	Cultural Resources:	Socioeco	nomic Resou	rces:	Public Health and Safety:
Human	None	None			None
Resources					
Military	Ingestible Material:		Military	None	
Expended	None		Recoverable	•	
Material	Non-Ingestible Material:		Material		
	Canister, weight, flotation	collar			
Sonar and	None			- <u>-</u>	
Other					
Transducer					
Bins					
Explosive	None				
Bins	BL 1 151 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		/c ·· -	2.41	
Procedural Mitigation	Physical Disturbance and Strike Stressors: (Section 5.3.4)				
Mitigation Measures	Vessel movement				
ivieasures	l				

Other Training	Other Training Exercises		
Unmanned Aerial System Training and Certification			
Assumptions	Unmanned aerial vehicles are typically recovered; however, some units may be lost and some		
Used for	are designed to be expendable. Submarine launched unmanned aerial systems result in		
Analysis	expenditure of ballast weight and launched capsule.		

A.1.10.11 Unmanned Underwater Vehicle Training

Other Training	Exercises			
	derwater Vehicle Training			
Short	Units conduct training with	Typical Duration		
Description	underwater vehicles from a variety of platforms including surface ships, small boats, and submarines.		Up to 24 hours	
Long Description	Conduct unmanned underwater vehicle activities in support of tactical and theater requirements. Unmanned underwater vehicle activities involves training with unmanned platforms on which various sensors and payloads are attached and used for different purposes, such as mine warfare, bottom mapping, and other missions. Vehicles may be crew served or mechanically launched from ships and submarines.			
Typical Components	Platforms: Surface ships, s vehicle Targets: Mine shapes Systems being Trained/Te sonar	Platforms: Surface ships, small boats, submarines, support craft, unmanned underwater vehicle Targets: Mine shapes Systems being Trained/Tested: Acoustic modem, high-frequency sonar, synthetic aperture		
Standard	Vessel safety	Typical Locations		
Operating Procedures (Section 2.3.3)	Unmanned aerial and underwater vehicle procedures Target deployment and retrieval safety	Range Complexes/Te Ranges: Mariana Islands Range	Apra Harbor and Mariana	
Stressors to Biological Resources	Acoustic: Sonar and other transducers Vessel noise Explosive: None	Physical Disturbance Vessels and in-water Military expended management Seafloor devices Ingestion: None	devices None	
Stressors to Physical Resources	Air Quality: Criteria air pollutants	Sediments and Water Quality: None		
Stressors to Human Resources	Cultural Resources: None	Socioeconomic Re Accessibility Airborne acoustics Physical disturband	Physical interactions In-air energy	
Military Expended Material	Ingestible Material: None Non-Ingestible Material: Anchors	Military Recover Material		
Sonar and Other Transducer Bins	Forward Looking Sonar: FLS2	Acoustic Modems M3	: Synthetic Aperture Sonar: SAS2 SAS4	

Other Training	Other Training Exercises			
Unmanned Un	Inmanned Underwater Vehicle Training			
Explosive	None			
Bins				
Procedural	Physical Disturbance and Strike Stressors: (Section 5.3.4)			
Mitigation	Vessel movement			
Measures				
Assumptions	None			
Used for				
Analysis				

A.2 TESTING ACTIVITIES

A.2.1 Naval Air Systems Command Testing Activities

Naval Air Systems Command activities will generally fall under Fleet primary mission areas, such as the testing of airborne mine warfare and anti-submarine warfare weapons and systems. Naval Air Systems Command activities include, but are not limited to, the testing of new aircraft platforms (e.g., the P-8 maritime patrol aircraft), weapons, and systems (e.g., newly developed sonobuoys) that will ultimately be integrated into Fleet training activities. In addition to testing new platforms, weapons, and systems, Naval Air Systems Command also conducts lot acceptance testing of sonobuoys and follow-on testing and evaluation of updated systems in support of Fleet operational units. In general, the potential environmental effects from most Naval Air Systems Command testing events are similar to the associated Fleet training events.

While many of these systems tested by Naval Air Systems Command will ultimately be used by the Fleet, testing activities involving the same or similar systems may be conducted in different locations and manners than when conducted by the Fleet. Because of these differences, the results of the analysis for testing activities may differ from the results for training activities.

A.2.1.1 Anti-Submarine Warfare

A.2.1.1.1 Anti-Submarine Warfare Torpedo Test

Anti-Submarin	e Warfare					
Anti-Submarin	Anti-Submarine Warfare Torpedo Test					
Short	This event is similar to the	training event	Typical Duration			
Description	torpedo exercise. Test eval		N			
•	warfare systems onboard i					
	wing aircraft and the abilit		2–6 flight hours per event			
	detect, classify, localize, tra	•	0 1 11 1			
	submarine or similar targe					
Long	Similar to a torpedo exercise, an anti-submarine warfare (ASW) torpedo test evaluates anti-					
Description		submarine warfare systems onboard rotary-wing (e.g., MH-60R helicopter) and fixed-wing				
	(marine patrol aircraft P-8,	P-3) aircraft and the abi	lity to search for, detect, classify, localize,			
	• · · · · · · · · · · · · · · · · · · ·		, MK-39 expendable mobile ASW training			
			bmarine warfare torpedo test is the			
			or MK-54), but other anti-submarine			
	warfare systems are often	used during the test. MK	-39 (EMATT) or MK-30 targets simulate a			
	submarine threat and are	deployed at varying dept	hs and speeds. If available, tests may be			
	conducted using an actual	submarine as the target.	This activity can be conducted in shallow or			
	deep waters and aircraft ca	an originate from a land l	pase or from a surface ship. The torpedo			
	test culminates with the re	elease of an exercise torp	edo against the target and is intended to			
	evaluate the targeting, rele	ease, and tracking proces	s of deploying torpedoes from aircraft. All			
	exercise torpedoes used in	testing are either runnir	ng or non- running and are non-explosive.			
	Eighty-five percent of torpedoes are recovered. A parachute assembly used for aircraft-					
	launched torpedoes is jettisoned and sinks. Ballast (typically lead weights) may be released					
	from the torpedoes to allow for recovery, and sink to the bottom.					
Typical	Platforms: Fixed-wing aircraft, rotary-wing aircraft, range support craft					
Components	Targets: Sub-surface targets					
	Systems being Trained/Te	sted: Torpedoes/torpedo	o launching systems			
Standard	Aircraft safety	Typical Locations				
Operating	Target Deployment and	Range Complexes/Test	ting Inland Waters/Pierside:			
Procedures	Retrieval Safety	Ranges:	None			
(Section	Weapons firing safety	Mariana Islands Trainin	g and			
2.3.3)		Testing Study Area				
Stressors to	Acoustic:	Physical Disturbance a	and Strike: Energy:			
Biological	Sonar and other	Aircraft and aerial targ	et In-air electromagnetic			
Resources	transducers	Vessels and in-water d	evices devices			
	Aircraft noise	Military expended mat	erials Entanglement:			
		Seafloor devices	Decelerators/parachutes			
	Explosive:	Ingestion:	Wires and cables			
	None	ingestion.	Wires and capies			
	None	Military expended mat	erials – other			
		than munitions				
Stressors to	Air Quality:	•	ts and Water Quality:			
Physical	Criteria air pollutants	Metals	Chemicals			
Resources	The same polluturity	Other ma				
Stressors to	Cultural Resources:	Socioeconomic Reso				
Human	Physical disturbance and	Accessibility	Underwater energy			
Resources	strike	Airborne acoustics	Physical interactions			
	55	Physical disturbance				
	<u> </u>	, sicai distai ballet	and strike			

Anti-Submarin	Anti-Submarine Warfare				
Anti-Submarin	Anti-Submarine Warfare Torpedo Test				
Military	Ingestible Material:	Military	Lightweight torpedo (non-explosive),		
Expended	Decelerators/parachutes - small	Recoverable	sub-surface target (mobile)		
Material	Non-Ingestible Material: Expended bathythermograph, expended bathythermograph wire, lightweight torpedo accessories, sonobuoy (non-explosive), sonobuoy wires,	Material			
Sonar and Other Transducer Bins	Mid-Frequency: Torpedo MF5 TORP1	oes:			
Explosive Bins	None				
Procedural Mitigation Measures	Acoustic Stressors: (Section 5.3.2) Active sonar Vessel movement Physical Disturbance and Strike Stressors: (Section 5.3.4) Vessel movement				
Assumptions Used for Analysis	Assume one torpedo accessory package (parachute, ballast) per torpedo. Assume one target per torpedo. This activity would occur greater than 3 NM from land.				

A.2.1.1.2 Anti-Submarine Warfare Tracking Test – Maritime Patrol Aircraft

Anti-Submarin	e Warfare			
	e Warfare Tracking Test – M	aritime Patrol Aircraft		
Short	The test evaluates the sens		Typical Duration	
Description	by maritime patrol aircraft submarines and to ensure used to deploy the tracking specifications and meet op requirements.	to detect and track that aircraft systems g systems perform to	8 flight hours per event	
Long Description	Similar to an anti-submarine warfare (ASW) tracking exercise-maritime patrol aircraft, an anti-submarine warfare tracking test – maritime patrol aircraft evaluates the sensors and systems used to detect and track submarines and to ensure that platform systems used to deploy the tracking systems perform to specifications and meet operational requirements. P-3 or P-8 fixed-wing aircraft conduct anti-submarine warfare testing using non-impulsive sonobuoys (e.g., AN/SSQ-62 DICASS), explosive sonobuoys (e.g., MK-61 SUS), passive sonobuoys (e.g., AN/SSQ-53 DIFAR), and smoke devices (e.g., MK-58). Targets (e.g., MK-39 Expendable Mobile ASW Training Target) may also be employed during an anti-submarine warfare scenario. If available, tests may be conducted using an actual submarine as the target. This activity would be conducted in deep (typically beyond 100 feet) waters. Some anti-submarine warfare maritime patrol aircraft tracking tests could be conducted as part of a coordinated event with Fleet training activities.			
Typical Components	Platforms: Fixed-wing aircraft, range support craft Targets: Sub-surface targets Systems being Trained/Tested: Sonobuoys/sonobuoy launching systems, data transmission systems			
Standard	Aircraft safety	Typical Locations		
Operating Procedures (Section 2.3.3)	Vessel safety Target Deployment and Retrieval Safety	Range Complexes/Testing Inland Waters/Pierside: Ranges: None Mariana Islands Training and Testing Study Area		
Stressors to Biological Resources	Acoustic: Sonar and other transducers Aircraft noise Vessel noise Explosive: In-air explosions In-water explosions	Physical Disturbance a Aircraft and aerial targ Vessels and in-water d Military expended mat Ingestion: Military expended mat than munitions	get In-air electromagnetic devices devices terials Entanglement: Decelerators/parachutes Wires and cables	
Stressors to Physical Resources	Air Quality: Criteria air pollutants	Sediments and Water Quality: Explosives Chemicals Metals Other materials		
Stressors to Human Resources	Cultural Resources: Explosives Physical disturbance and strike	Socioeconomic Reso Accessibility Airborne acoustics Physical disturbance	Underwater energy Physical interactions	

Anti-Suhmarin	Anti-Submarine Warfare					
	Anti-Submarine Warfare Tracking Test – Maritime Patrol Aircraft					
Military Expended Material	Ingestible Material: Sonobuoy (explosive) fragments, decelerators/parachutes – small Non-Ingestible Material: Expended bathythermograph, expended bathythermograph wire, sonobuoy (non-explosive), sonobuoy	Military Recoverable Material	Sub-surface target (mobile)			
Sonar and Other Transducer Bins	Anti-Submarine Warfare: Mid-Fre ASW2 ASW5 MF5	quency: MF6				
Explosive Bins	E1 E3					
Procedural Mitigation Measures	Acoustic Stressors: (Section 5.3.2) Active sonar Explosive Stressors: (Section 5.3.3) Explosive Sonobuoys					
Assumptions Used for Analysis	This activity would occur greater than 3	NM from land.				

A.2.1.2 Electronic Warfare

A.2.1.2.1 Intelligence Surveillance Reconnaissance/Electronic Warfare Testing

Electronic Warfar	e				
ISR/EW Testing					
Short	Aircrews use all available s	ensors to coll	ect data on thre	at _	Typical Duration
Description	vessels.				2–20 flight hours per event
Long Description	An air warfare intelligence, surveillance, and reconnaissance (ISR) test involves evaluating communications capabilities of aircraft, including unmanned aerial systems that can carry cameras, sensors, communications equipment, or other payloads. New systems are tested at sea to ensure proper communications between aircraft and ships. ISR aircraft systems act as eyes in the sky, relaying raw imagery back to military personnel on the ground or to ships at sea. The data is processed, analyzed, and shared with U.S. Navy or other U.S. military aircraft or vessels. New ISR technology systems provide combat identification (friend or foe) and are used for aircraft and ship-based communications.				
Typical	Platforms: Unmanned aeri	al system – fi	xed-wing		
Components	Targets: None				
	Systems being Trained/Te				
Standard	Unmanned aerial and	Typical Loc			
Operating	underwater vehicle	Range Com	plexes/Testing		Inland Waters/Pierside:
Procedures	procedures	Ranges:			None
(Section 2.3.3)			ands Range Com	plex;	
_		Guam; Tinian; Rota; Saipan			
Stressors to	Acoustic:	-	sturbance and S	trike:	Energy:
Biological Resources	None	Aircraft an	d aerial targets		In-air electromagnetic devices
Resources	Explosive:	Ingestion:			devices
	None	None			Entanglement:
					None
Stressors to	Air Quality:		Sediments an	d Wate	r Quality:
Physical	Criteria air pollutants		None		
Resources					
Stressors to	Cultural Resources:		onomic Resource	es:	Public Health and Safety:
Human	None	Airborne	acoustics		Physical interactions
Resources		-	I	T	
Military	Ingestible Material:		Military Recoverable	None	
Expended Material	None		Material		
iviaterial	Non-Ingestible Material:		iviateriai		
	None				
Sonar and	None				
Other Transducer Bins					
	None				
Explosive Bins Procedural			-		
Mitigation	None				
Measures					
Assumptions	None				
Used for	INOTIC				
Analysis					
Allulysis					

A.2.1.3 Surface Warfare

Surface warfare is a type of naval warfare in which aircraft, surface ships, and submarines employ weapons, sensors, and operations directed against enemy surface vessels. Naval Air Systems Command surface warfare tests include air-to-surface missile, gunnery, and bombing tests, rocket tests, laser targeting tests, and high-energy laser weapons tests.

A sinking exercise is a specialized Fleet training event that provides an opportunity for Naval Air Systems Command aircrew along with ship and submarine crews to deliver explosive ordnance on a deactivated vessel that has been cleaned and environmentally remediated. The vessel is deliberately sunk using multiple weapons systems. A Naval Air Systems Command testing event may take place in conjunction with a sinking exercise to test aircraft or aircraft systems in the delivery of explosive ordnance on a surface target.

A.2.1.3.1 Air-to-Surface Missile Test

Surface Warfai	re					
Air-to-Surface						
Short	This event is similar to the	training even	t missile T	ypical Duration		
Description	exercise air-to-surface. Tes	_				
	fixed-wing and rotary-wing	g aircraft laun	ching			
	missiles at surface maritim	e targets to e	valuate 2	–4 flight hours per event		
	the weapons system or as	part of anoth	er			
	systems integration test.					
Long	Similar to a missile exercise	air-to-surface, an air-to-surface missile test may involve both fixed-				
Description	=	aft launching missiles at surface maritime targets to evaluate the				
			of another systems integration test. Air-to-surface missile tests can			
	= -	-		aptive air training missile) weapons. Laser		
		be used. Bot	th stationary a	and mobile targets would be utilized during		
	testing					
Typical	Platforms: Fixed-wing airci	raft				
Components	Targets: Surface targets					
	Systems being Trained/Te			ng systems		
Standard	Aircraft safety	Typical Loca	ations			
Operating	Laser Procedures	_	plexes/Testin	g Inland Waters/Pierside:		
Procedures	Weapons firing safety	Ranges:		None		
(Section	Target deployment and		ands Training			
2.3.3)	retrieval safety	_	dy Area, Prima	ary areas:		
		Special Use Airspace				
Stressors to	Acoustic:	Physical Disturbance and Strike: Energy:		<u> </u>		
Biological	Aircraft noise	Aircraft and aerial targets In-air electromagnetic				
Resources	Weapons noise	Military expended materials devices				
	Explosive:	Ingestion:				
	In-air explosions	Military exp	oended mater	rials – Entanglement:		
	In-water explosions	munitio	ns	None		
			oended mater	rials – Other		
		than mu	initions			
Stressors to	Air Quality:		Sediments	and Water Quality:		
Physical	Criteria air pollutants		Explosives	Chemicals		
Resources			Metals	Other materials		
Stressors to	Cultural Resources:	Socioeco	nomic Resou	rces: Public Health and Safety:		
Human	Explosives	Accessib	ility	Physical interactions		
Resources	Physical disturbance and	Airborne	acoustics			
	strike	Physical	disturbance a	nd strike		
Military	Ingestible Material:		Military	Surface target (mobile and stationary		
Expended	Missile (explosive) fragmer	nts, target	Recoverable	e		
Material	fragments		Material			
	Non-Ingestible Material:					
	None					
Sonar and	None					
Other						
Transducer						
Bins						

Surface Warfa	re					
Air-to-Surface	to-Surface Missile Test					
Explosive	E10					
Bins						
Procedural	Physical Disturbance and Strike Stressors:	Explosive Stressors: (Section 5.3.3)				
Mitigation	(Section 5.3.4)	Explosive missiles and rockets				
Measures	Non-explosive missiles and rockets					
Assumptions	This activity would typically occur greater than 50 NM from shore.					
Used for	· · · · · · · · · · · · · · · · · · ·					
Analysis						

A.2.2 NAVAL SEA SYSTEMS COMMAND TESTING ACTIVITIES

A.2.2.1 Anti-Submarine Warfare

A.2.2.1.1 Anti-Submarine Warfare Mission Package Testing

Anti-Submarine Warfare Mission Package TestingShortShips and their supporting platforms (e.g., helicopters and unmanned aerial systems) detect, localize, and prosecute submarines.Typical DurationLongLittoral combat ships conduct detect-to-engage operations against modern diesel-electric and nuclear submarines using airborne and surface assets (both manned and unmanned). Active are constant and constant are constant as a constant and constant are constant as a constant are constant.	ort scription ng
Descriptionhelicopters and unmanned aerial systems) detect, localize, and prosecute submarines.1–2 weeks, with 4–8 hours of active sonar use with intervals of non-activity in betweenLong DescriptionLittoral combat ships conduct detect-to-engage operations against modern diesel-electric and nuclear submarines using airborne and surface assets (both manned and unmanned). Active ar	scription
Long Description detect, localize, and prosecute submarines. use with intervals of non-activity in betwee use with intervals of non-activity in between use with intervals of non-activity in bet	ng
Long Description Littoral combat ships conduct detect-to-engage operations against modern diesel-electric and nuclear submarines using airborne and surface assets (both manned and unmanned). Active are	_
Description nuclear submarines using airborne and surface assets (both manned and unmanned). Active ar	_
	scription
passive acoustic systems are used to detect and track submarine targets, culminating in the	
deployment of lightweight torpedoes to engage the threat.	ai a a l
Typical Platforms: Rotary-wing aircraft, surface combatant Components Targets: Sub-surface targets	
Systems being Trained/Tested: Sonar systems, countermeasure systems, torpedo systems,	inponents
sonobuoys	
Standard Vessel safety Typical Locations	ndard
Operating Aircraft safety Range Complexes/Testing Inland Waters/Pierside:	
Procedures Towed in-water device safety Ranges: None	_
(Section Target deployment and retrieval Mariana Islands Range	ection
2.3.3) safety Complex	3.3)
Stressors to Acoustic: Physical Disturbance and Strike: Energy:	essors to
Biological Sonar and other Aircraft and aerial targets In-air electromagnetic	ological
Resources transducers Vessels and in-water devices devices	sources
Aircraft noise Military expended materials Entanglement:	
Vessel noise Ingestion: Decelerators/parachutes	
Explosive: Military expended materials – other Wires and cables	
None than munitions	
Stressors to Air Quality: Sediments and Water Quality:	
Physical Criteria air pollutants Metals Chemicals	
Resources Other materials	sources
Stressors to Cultural Resources: Socioeconomic Resources: Public Health and Safety	
Human Physical disturbance and Accessibility Underwater energy	-
ResourcesstrikeAirborne acousticsIn-air energyPhysical disturbance and strikePhysical interactions	sources
Military Ingestible Material: Military Sub-surface target (mobile) –	litary
Expended Decelerators/parachutes - small Recoverable recovered, lightweight torpedo (n	-
Material explosive)	
Non-ingestible Material:	
Acoustic countermeasures, expended	
bathythermograph, expended bathythermograph wire, lightweight	
torpedo accessories, sonobuoy (non-	
explosive), sonobuoy wires	
Sonar and Anti-Submarine Warfare: Mid-Frequency: Torpedoes:	nar and
Other ASW1 ASW2 MF4 MF5 TORP1	
Transducer ASW3 ASW5 MF12	
Bins	ıs

Anti-Submarin	Anti-Submarine Warfare						
Anti-Submarin	i-Submarine Warfare Mission Package Testing						
Explosive	None						
Bins							
Procedural	Acoustic Stressors: (Section 5.3.2)	Physical Disturbance and Strike Stressors:					
Mitigation	Active sonar	(Section 5.3.4)					
Measures		Vessel movement					
	Towed in-water devices						
Assumptions	All sonobuoys have parachutes unless otherwise noted. Sub-surface targets are submarines.						
Used for							
Analysis							

A.2.2.1.2 At-Sea Sonar Testing

Anti-Submarin	e Warfare								
At-Sea Sonar T									
Short	At-sea testing to ensure sy	stems are fully	Тур	ical Durat	ion				
Description	functional in an open ocea	•			to 11 days				
Long	At-sea sonar testing is requ		_		•	sonar and torpedo			
Description	systems while the ship or s				-	•			
·	conducted to verify the shi	The state of the s				_			
	characteristics of the ship,	•	-						
	characteristics, and provide	e technical backgrour	nd neces	sary to ini	tiate develo	opment of design			
	improvements to reduce n	reduce noise. Tests also consist of electronic support measurement,							
	photonics, and sonar senso	or accuracy testing. In	some in	istances, a	a submarine	e's passive			
	detection capability is tested when a second submarine utilizes its active sonar or is equipped								
	with a noise augmentation	•	eplicate a	acoustic o	r electroma	gnetic signatures			
	of other vessel types or classes.								
Typical	Platforms: Fixed platform,	submarines							
Components	Targets: None								
	Systems being Trained/Te		requency	/ sonar, ac	coustic mod	ems			
Standard	Vessel safety	Typical Locations							
Operating		Range Complexes/	Testing		Inland Wat	ters/Pierside:			
Procedures		Ranges:			None				
(Section		Mariana Islands Tra	iining an	d					
2.3.3)		Testing Study Area							
Stressors to	Acoustic:	Physical Disturban			Energy:				
Biological	Sonar and other	Military expended	material	S		r electromagnetic			
Resources	transducers	Ingestion:			devid				
	Explosive:	None			in-air eid devid	ectromagnetic			
	None				uevi	ces			
					Entangle				
						nd cables			
Stressors to	Air Quality:			d Water (Quality:				
Physical	Criteria air pollutants	Meta	. •						
Resources			r materia						
Stressors to	Cultural Resources:	Socioeconomi	c Resour	ces:		lth and Safety:			
Human	None	Accessibility			Underwate	٠,			
Resources		Airborne acous			In-air energ				
		Physical distur strike	bance ar	ıa	Physical int	eractions			
B.A.: Liberry	In sectible Meterial			Nana					
Military Expended	Ingestible Material: None	Milita	ry erable	None					
Material	None	Mater							
Waterial	Non-Ingestible Material:		iai						
	Expended bathythermogra	· ·							
	expended bathythermogra	ph wire							
Sonar and	High-Frequency:	Acoustic Mode	ms:		Mid-Frequ	=			
Other	HF1 HF6	M3			MF3	MF9			
Transducer									
Bins									
Explosive	None								
Bins									

Anti-Submarine Warfare						
At-Sea Sonar Testing						
Procedural	Acoustic Stressors: (Section 5.3.2)	Physical Disturbance and Strike Stressors:				
Mitigation	Active sonar	(Section 5.3.4)				
Measures		Vessel movement				
Assumptions	Active sonar is intermittent throughout the duration of this event.					
Used for						
Analysis						

A.2.2.1.3 Torpedo (Explosive) Testing

Anti-Submarine Warfare						
Torpedo (Explo						
Short	Air, surface, or submarine of	rews employ	,	Tvp	ical Duration	
Description	explosive and non-explosiv artificial targets.				days during daylight hours	
Long Description	Non-explosive and explosive torpedoes (carrying a warhead) will be launched at a suspended target by a submarine and fixed- or rotary-wing aircraft or surface combatants. Event duration is one to two days during daylight hours.					
Typical Components	Platforms: Fixed-wing aircraft, rotary-wing aircraft, moored platform, submarines, support craft, surface combatant Targets: Sub-surface targets; surface targets Systems being Trained/Tested: Sonar systems, acoustic countermeasures, sonobuoys, torpedo systems					
Standard	Vessel safety	Typical Loca	ations			
Operating Procedures (Section	Aircraft safety Weapons firing safety Target deployment and	Range Com Ranges: Mariana Isl	plexes/Te	_	Inland Waters/Pierside: None Iplex	
2.3.3)	retrieval safety					
Stressors to Biological Resources	Acoustic: Sonar and other transducers Aircraft noise	Physical Disturbance and Strike: Energy: Aircraft and aerial targets In-air electromagnetic Vessels and in-water devices devices				
	Vessel noise Explosive:	Military expended materials Ingestion: Decelerators/parachutes Military expended materials – Wires and cables				
	In-water explosions	munitio Military exp than mu	pended ma	iterial	s – other	
Stressors to	Air Quality:				d Water Quality:	
Physical	Criteria air pollutants		Explosiv	es	Chemicals	
Resources			Metals		Other materials	
Stressors to	Cultural Resources:		nomic Res	ource	-	
Human Resources	Explosives Physical disturbance and	Accessibi	acoustics		In-air energy Underwater energy	
Resources	strike		disturbanc	e and		
Military Expended Material	Ingestible Material: Lightweight torpedo (explo fragments, heavyweight tor (explosive) fragments, decelerators/parachutes - starget fragments	sive) rpedo	Military Recovera Material	able	Heavyweight (non-explosive) torpedo, lightweight torpedo (non-explosive), sub-surface target (stationary), surface target (stationary)	
	Non-Ingestible Material: Buoy (non-explosive), expetibathythermograph, expending bathythermograph wire, guwire, heavyweight torpedo accessories, lightweight torpedo accessories, sonobuoy (non explosive), sonobuoy wires	led iidance pedo I-				

Anti-Submarin	e Warfare						
Torpedo (Explo	Torpedo (Explosive) Testing						
Sonar and	Anti-Submarine Warfare:	High-Fre	equency:	Mid-Frequency:			
Other	ASW3	HF1	HF6	MF1 MF3			
Transducer	Torpedoes:			MF4 MF5			
Bins	TORP1 TORP2			MF6			
Explosive	E8 E11			-			
Bins							
Procedural	Acoustic Stressors: (Section S	5.3.2)	Explos	sive Stressors: (Section 5.3.3)			
Mitigation	Active sonar		Explos	ive torpedoes			
Measures	Physical Disturbance and Str	ike Stresso	rs:				
	(Section 5.3.4)						
	Vessel movement						
Assumptions	Only one heavyweight torpe	do test coul	d occur on a sing	gle day; two heavyweight torpedo tests			
Used for	could occur on consecutive d	lays. Two lig	ghtweight torped	do tests could occur in a single day.			
Analysis	All non-explosive torpedoes	are recover	ed.				

A.2.2.1.4 Torpedo (Non-Explosive) Testing

Anti-Submarin	e Warfare						
	- Explosive) Testing						
Short	Air, surface, or submarine of	crews employ	non-	Турі	cal Duration		
Description	explosive torpedoes agains surface vessels.		or Up to 2 weeks				
Long Description	Aerial, surface, and subsurface assets fire exercise torpedoes against surface or subsurface targets or at no target and programmed with a particular run geometry. Torpedo testing evaluates the performance and the effectiveness of hardware and software upgrades of						
	heavyweight or lightweight torpedoes. It also includes testing of experimental torpedoes. Not all torpedo tests involve acoustics. Exercise torpedoes are recovered, typically from surface ships and helicopters that are specifically crewed and outfitted for torpedo recovery. Event duration is dependent on number of torpedoes fired.						
Typical Components	Platforms: Fixed-wing aircr surface combatant Targets: Sub-surface target			moore	ed platform, submarines, support craft,		
	Systems being Trained/Tes systems	-	_	ustic c	ountermeasures, sonobuoys, torpedo		
Standard	Vessel safety	Typical Loca					
Operating	Aircraft safety	Range Comp	-	_	-		
Procedures	Weapons firing safety	Mariana Islands Range Complex None					
(Section 2.3.3)	Target deployment and retrieval safety						
Stressors to	Acoustic:	Physical Dis	sturbance a	nd Str	rike: Energy:		
Biological	Sonar and other	Aircraft and			In-air electromagnetic		
Resources	transducers	Vessels and	_				
	Aircraft noise	Military exp	ended mat	erials	Fortage along a set.		
	Vessel noise	Ingestion:			Entanglement: Decelerators/parachutes		
	Explosive:	Military exp	ended mat	erials			
	None	than mu		Cilais	other wires and cables		
Stressors to	Air Quality:			ts and	Water Quality:		
Physical	Criteria air pollutants		Chemica		, , , , , , , , , , , , , , , , , , ,		
Resources	·		Metals		Other materials		
Stressors to	Cultural Resources:	Socioeco	nomic Res	ources	: Public Health and Safety:		
Human	Physical disturbance and	Accessibi	lity		Underwater energy		
Resources	strike	, 506	acoustics		In-air energy		
		Physical o	disturbance	and s			
Military	Ingestible Material:		Military		Heavyweight (non-explosive)		
Expended	Decelerators/parachutes - s	small	Recovera	ble	torpedo, lightweight torpedo (non-		
Material	Non-Ingestible Material:		Material		explosive), sub-surface target (mobile), sub-surface target		
	Acoustic countermeasures,	buoy (non-			(stationary)		
	explosive), expended				(Stationary)		
	bathythermograph, expend						
	bathythermograph wire, gu						
	wire, heavyweight torpedo						
	lightweight torpedo accesso						
	anti-torpedo torpedo, anti-	•					
	torpedo accessories, sonob explosive), sonobuoy wires	uoy (11011-					
	explosive), sonobuoy wires						

Anti-Submarin	Anti-Submarine Warfare						
Torpedo (Non- Explosive) Testing							
Sonar and	Anti-Subm	narine Warfare:	High-Freq	uency:	Low-Frequency:		
Other	ASW3	ASW4	HF1	HF6	LF4		
Transducer Bins	Mid-Frequ	iency:	Torpedoe	s:			
Dillo	MF1	MF3	TORP1	TORP2			
	MF4	MF5	TORP3				
	MF6						
Explosive	None		-		.		
Bins							
Procedural	Acoustic S	tressors: (Section 5.3.2))	Physical Dist	urbance and Strike Stressors:		
Mitigation	Active son	ar		(Section 5	5.3.4)		
Measures				Vessel move	ment		
Assumptions	All torpedoes are recovered.						
Used for	Events can last up to two weeks and use up to 40 torpedoes. Typically, no more than eight						
Analysis	torped	oes are fired per day dı	uring daylight h	ours.			

A.2.2.2 Electronic Warfare

A.2.2.2.1 Radar and Other System Testing

Electronic War	Electronic Warfare						
	er System Testing						
Short	Test may include radiation	of military or	. 1	Tyni	cal Duration		
Description	commercial radar, commun	-		1 7 1	cui Duracion		
	simulators), or high-energy	•	•				
	occur aboard a ship against	1 1) hours nor day over a 7-day norio					
	rockets, missiles, or other targets.						
Long	At-sea and docked testing may use radiation of military or commercial radar, communication						
Description	systems (or simulators), or	high-energy	lasers. No si	ubsur	face transmission will occur during this		
			_	-	lude unmanned aerial systems, or		
	, ,	-	-		or self-propelled vessels). High-		
		clude trackin	g, scoring, a	ınd ne	eutralization runs with single or		
	multiple targets.						
Typical	Platforms: Surface combata						
Components	Targets: Air targets; surface	_					
6	Systems being Trained/Tes				S		
Standard	Vessel safety		al Locations				
Operating Procedures	Laser Procedures Unmanned aerial and	_	e Complexe	s/Tes	_		
(Section	underwater vehicle	Range		-rainir	None		
2.3.3)	procedures	Mariana Islands Training and Testing Study Area					
2.3.3)	High-energy laser safety	anu i	esting study	Alea	ı		
	Target deployment and						
	retrieval safety						
Stressors to	Acoustic:	Physical Di	sturbance a	nd St	rike: Energy:		
Biological	Vessel noise	Aircraft and	d aerial targ	ets	In-air electromagnetic		
Resources	Aircraft noise	Vessels and	d in-water d	evice	s devices		
	Explosive:	Military exp	pended mat	erials			
	None	Ingestion:			devices		
		None			Lasers		
					Entanglement:		
					None		
Stressors to	Air Quality:	=	Sediment	ts and	l Water Quality:		
Physical	Criteria air pollutants		Other ma	iterial	S		
Resources							
Stressors to	Cultural Resources:		conomic Re	esour	•		
Human	Physical disturbance and	Access	•		In-air energy		
Resources	strike		ne acoustics		Physical interactions		
		-	al disturban	ce an	a		
Militory	Ingostible Meterial:	str			Surface target (mobile and		
Military Expended	Ingestible Material: None		Military Recoveral	hle	Surface target (mobile and stationary), air targets		
Material			Material	JIE	stationary), an targets		
Widterial	Non-Ingestible Material:		Material				
	Decelerators/parachutes –	large, air					
	target (drone)						

Electronic War	Electronic Warfare					
Radar and Oth	Radar and Other System Testing					
Sonar and	None					
Other						
Transducer						
Bins						
Explosive	None					
Bins						
Procedural	Physical Disturbance and Strike Stressors: (Section 5.3.4)					
Mitigation	Vessel movement					
Measures						
Assumptions	High-energy lasers will not be tested pierside.					
Used for	Any sources used during this activity would be de minimis and not quantitatively analyzed and					
Analysis	therefore are not included under munitions.					

A.2.2.3 Mine Warfare

A.2.2.3.1 Mine Countermeasure and Neutralization Testing

Mine Warfare						
Mine Counterr	measure and Neutralization To	esting				
Short				Typical Dur	ration	
Description	Air, surface, and subsurface	vessels	s neutralize		with intermittent use of	
	threat mines and mine-like			-	sure/neutralization systems	
		•		during this	-	
Long	Mine countermeasure-neut	ralizatio	on and mine sys	tem testing is	s required to ensure systems	
Description	can effectively neutralize th	reat (liv	ve or inert) mine	es that will ot	herwise restrict passage	
	through an area and to ensu	ıre U.S.	Navy mines rer	main effective	e against enemy ships. These	
	systems may be deployed w	ith a va	ariety of ships, a	ircraft, subm	arines, or unmanned	
			-	-	feet. Mines are neutralized by	
	cutting mooring cables of bu	-	-	_		
			-	_	trical energy to replicate the	
		-			t mines, detonation of mines	
	using remotely-operated ve					
Typical	Platforms: Amphibious war				,	
Components	wing, rotary-wing aircraft, s Targets: Mine shapes	urrace	compatant, unn	nanmed under	rwater venicie	
	Systems being Trained/Test	ted: Fle	ectromagnetic d	evices high-f	requency sonar radar low	
	energy lasers	icu. Lic	eti omagnetie a	evices, mgm	requeriey sonar, radar, row	
Standard	Vessel safety		Typical Locati	ons		
Operating	Aircraft safety		Range Compl		Inland Waters/Pierside:	
Procedures	Unmanned aerial and		Ranges:	cacs, resting	None	
(Section	underwater vehicle		Mariana Islan	ds Range		
2.3.3)	procedures		Complex, nea	-		
	Towed in-water device safet	:у	littorals	,		
	Laser Procedures					
	Target deployment and retri	ieval				
	safety					
Stressors to	Acoustic:	-	cal Disturbance		Energy:	
Biological	Sonar and other		ft and aerial tar	_	In-water electromagnetic	
Resources	transducers		ls and in-water		devices	
	Aircraft noise		ry expended ma	iteriais	In-air electromagnetic	
	Vessel noise	Seano	or devices		devices	
	Explosive:					
	In-water explosions	Ingest			Entanglement:	
			ry expended ma	iterials –	Wires and cables	
		mu	inition <u>s</u>			
Stressors to	Air Quality:			nts and Wate	-	
Physical	Criteria air pollutants	Explosives Chemicals				
Resources	- I		Metals		Other materials	
Stressors to	Cultural Resources:		ioeconomic Res	sources:	Public Health and Safety:	
Human	Explosives		essibility		Underwater energy	
Resources			orne acoustics	o and strike	In-air energy	
		Pny	sical disturbanc	e and strike	Physical interactions	

Mine Warfare	Mine Warfare						
Mine Countermeasure and Neutralization Testing							
Military	Ingestible Material:	Military	Anchor - mine				
Expended	Neutralizer (explosive) fragments	Recoverable					
Material	Non-Ingestible Material: Fiber optic cable, fiber optic can, mine shape (non-explosive)	Material					
Sonar and Other Transducer Bins	High-Frequency: HF4						
Explosive Bins	E4		,				
Procedural Mitigation Measures	Acoustic Stressors: (Section 5.3.2) Active sonar Physical Disturbance and Strike Stressors: (Section 5.3.4) Vessel movement Towed in-water devices Explosive Stressors: (Section 5.3.3) Explosive Stressors: (Section 5.3.3) neutralization activities						
Assumptions Used for Analysis	Agat Bay underwater detonation site, 20 and Outer Apra Harbor underwater deto	•	= : : : = =				

A.2.2.4 Surface Warfare Testing

A.2.2.4.1 Kinetic Energy Weapon Testing

Surface Warfai	·e					
	Weapon Testing					
Short	A kinetic energy weapon u	ses stored en	ergy	Typical I	Duration	
Description	released in a burst to accel			Typical Duration 1 day		
Long	A kinetic energy weapon uses stored energy released in a burst to accelerate a projectile to					
Description	more than seven times the speed of sound to a range of up to 200 miles.					
-	Platforms: Surface combat	•	iliu to a rang	ge or up t	o zoo iiiies.	
Typical						
Components	Targets: Air targets, surface targets Systems being Trained/Tested: Kinetic energy weapon					
<u> </u>				JOH		
Standard	Vessel safety	Typical Loca		_		
Operating	Weapons firing safety	_	plexes/Test	ing	Inland Waters/Pierside:	
Procedures		Ranges:			None	
(Section			ands Trainin	_		
2.3.3)		_	dy Area, Prin	nary area	is:	
		Special Use	•			
Stressors to	Acoustic:	•	sturbance a			
Biological	Vessel noise		d aerial targ		In-air electromagnetic	
Resources	Weapons noise		d in-water de		devices	
	Explosive:	Military ex	pended mat	erials	Entanglement:	
	In-air explosions	Ingestion:			None	
	m an expressions	_	pended mat	erials –		
		munitio		0.10.0		
			pended mat	erials – o	ther	
		than mu	-	0		
Stressors to	Air Quality: Sediments and Water Quality:					
Physical	Criteria air pollutants Metals					
Resources	position and position and					
Stressors to	Cultural Resources: Socioeconomic Resources: Public Health and Safety:					
Human	Physical disturbance and	Accessibility In-air energy				
Resources	strike		acoustics		Physical interactions	
		Physical disturbance and strike				
Military	Ingestible Material:	,	Military		one	
Expended	Large caliber (explosive) fra	agments	Recoverab		,	
Material	target fragments	.gc	Material	, .		
	Non-Ingestible Material:					
	Air target (drone),					
	decelerator/parachute – la	•				
	energy round, large caliber					
	(non-explosive), large calib	_				
	sabot - kinetic energy roun	d, surface				
	target (stationary)					
Sonar and	None					
Other						
Transducer						
Bins						
	None					
Explosive Bins	None					

Surface Warfar	Surface Warfare		
Kinetic Energy Weapon Testing			
Procedural	Physical Disturbance and Strike Stressors: (Section 5.3.4)		
Mitigation	Vessel movement		
Measures			
Assumptions	Assume one target per event.		
Used for	Explosive rounds are designed to detonate above the surface target.		
Analysis			

A.2.2.5 Vessel Evaluation

A.2.2.5.1 Undersea Warfare Testing

Vessel Evaluat	ion					
Undersea War						
Short	Ships demonstrate capabili	ty of counter	measure	Typi	cal Duration	
Description	systems and underwater su	-		. , ,		
	engagement and communications systems. This tests ships ability to detect, track, and engage undersea targets. Up to 10 days					
Long	Undersea warfare events n	nay be compr	ised of trac	cking a	and firing events or tests of hull-mounted	
Description	sonar system capabilities to detect and avoid torpedo type targets. Tracking and firing events					
	•				its interface with the rotary-wing	
	T-1	_	-		ship to search, detect, and track a	
	_		-		ection and avoidance events may use	
		•		-	pility of mid- and high-frequency acoustic	
	·				ped weapons, sonobuoys, towed arrays	
	may precede the event.	ke devices ma	ay be used.	Appro	oximately one week of in-port training	
Typical	Platforms: Rotary-wing airc	craft surface	combatant	+		
Components	Targets: Sub-surface target		Combatani			
Components	_		c counterm	easur	es, sonar systems, sonobuoys, torpedo	
	sonar	51041 71004361	counten	.casar	es, sonar systems, sonobacys, torpeac	
Standard	Vessel safety	Typical Loca	ations			
Operating	Aircraft safety	Range Com		ting R	anges: Inland Waters/Pierside:	
Procedures	Target deployment and	Mariana Islands Range Complex None				
(Section	retrieval safety	F				
2.3.3)						
Stressors to	Acoustic:	Physical Disturbance and Strike: Energy:				
Biological	Sonar and other	Aircraft and aerial targets In-air electromagnetic				
Resources	transducers	Vessels and in-water devices devices				
	Aircraft noise	Military expended materials Entanglement:				
	Vessel noise	Ingestion: Decelerators/parachutes				
	Explosive:	Military expended materials – other Wires and cables				
	None	than munitions				
Stressors to	Air Quality:	Sediments and Water Quality:				
Physical	Criteria air pollutants	Metals Other materials				
Resources						
Stressors to	Cultural Resources:		nomic Res	ource	•	
Human	Physical disturbance and	Accessibility Underwater energy				
Resources	strike		acoustics		In-air energy	
A 4*1**		Physical	disturbance	e and s		
Military	Ingestible Material:	II	Military Recovera	la la	Lightweight torpedo (non-explosive),	
Expended Material	Decelerators/parachutes - s	smaii	Material	bie	sub-surface target (mobile)	
Widterial	Non-Ingestible Material:		wiaterial			
	Expended bathythermogra					
	expended bathythermogra					
	lightweight torpedo accesso					
	sonobuoy (non-explosive),	sonobuoy				
	wires					

Vessel Evaluation							
Undersea War	Undersea Warfare Testing						
Sonar and	High-Frequency:	Mid-Fred	juency:	Torpedoes:			
Other	HF4	MF1	MF4	TORP1			
Transducer		MF5					
Bins							
Explosive	None	-		•			
Bins							
Procedural	Acoustic Stressors: (Section	on 5.3.2)	Physical	Disturbance and Strike Stressors:			
Mitigation	Active sonar		(Secti	ion 5.3.4)			
Measures			Vessel m	ovement			
Assumptions	Five targets per event.						
Used for	Sonobuoys from surface ships do not have an associated parachute.						
Analysis	Ships will not be conducti	ng test constan	tly during the enti	ire duration.			

A.2.2.6 Other Testing

A.2.2.6.1 Simulant Testing

Other Testing	Activities						
Simulant Testi	ng						
Short	The capability of surface sh	ip defense sys	tems to	Турі	ical Dura	tion	
Description	detect and protect against			3 days			
	biological attacks are tested.				<u> </u>		
Long	The capabilities of surface ship defense systems to detect and protect in the event of chemical						
Description	and biological attacks are tested. Testing involves the deployment of harmless compounds (i.e.,						
	simulants) as substitutes for chemical and biological warfare agents. Methods of simulant delivery include aerial dispersal and hand-held spray.						
Tunical							
Typical Components	Platforms: Fixed-wing aircr Targets: None	art, rotary-wir	ig aircrait,	, surra	ice comb	atant	
Components	Systems being Trained/Te	sted: None					
Standard	Vessel safety	Typical Local	tions				
Operating	Aircraft safety	Range Comp		ting		Inland Waters/Piers	sido:
Procedures	7 in Grant Sarety	Ranges:	ilexes/ i es	ung		None	siuc.
(Section		Marianas Isla	ands Train	ing ar	nd	Ttone	
2.3.3)		Testing Study		0 -			
Stressors to	Acoustic:	Physical Dis	•	and S	trike:	Energy:	
Biological	Aircraft noise	Aircraft and				In-air electromag	netic
Resources	Vessel noise	Vessels and	in-water o	device	!S	devices	
	Explosive:	xplosive: Ingestion: Entanglemen				Entanglement:	
	None	None				None	
Stressors to	Air Quality:		Sedimen	ts and	d Water	Quality:	
Physical	Criteria air pollutants	Chemicals				ther materials	
Resources							
Stressors to	Cultural Resources:	Socioeconomic Resources: Public Health and Safety:				afety:	
Human	None	Access	ibility			Physical interactions	5
Resources			ne acousti		_		
		· · · · · · · · · · · · · · · · · · ·	al disturba 	ince a	nd		
B 4*1**		str			·		
Military Expended	Ingestible Material:		Military Recovera	hlo	None		
Material	None		Material	bie			
Waterial	Non-Ingestible Material:		Widterial				
	None						
Sonar and	None						
Other							
Transducer Bins							
Explosive	None						
Bins	None						
Procedural	Physical Disturbance and S	trike Stressor	s: (Section	5.3.4)		
Mitigation	Vessel movement		(00000011	J.J. T	,		
Measures							
Assumptions	All chemical simulants have	low toxicity to	humans a	and th	ne enviro	nment. Examples of c	hemical
Used for	simulants include glacia	-					
Analysis	considered to be Biosafe	ety Level 1 orga	nisms. Exa	mples	s of biolo	gical simulants are spo	ore-

Other Testing Activities			
Simulant Testin	ng		
	forming bacteria, non-spore-forming bacteria, the protein ovalbumin, MS2 bacteriophages, and		
	the fungus Aspergillus niger.		

A.2.3 OFFICE OF NAVAL RESEARCH TESTING ACTIVITIES

A.2.3.1 Acoustic and Oceanographic Research

Acoustic and C	Oceanographic Science and To	echnology				
	Oceanographic Research					
Short	Research of oceanographic	nrocossos us	ing T	Typical Dura	tion	
Description		-		ypical Dura	ition	
Description	•	smissions, typically high-frequency				
	(38 kHz and above) oceano	-				
	measurement devices, deployed from ships, 1–2 weeks					
	unmanned underwater vehicles and on moored					
	platform					
Long	•	• .	-		corial waters and international	
Description	waters using passive measi			-		
				-	ms may be deployed by ship,	
			andard ocean	ographic m	oorings. Moorings may be left	
	in place for more than 1 ye					
Typical	Platforms: Research vessel	ls, unmanned	vehicles, oce	anographic	moorings	
Components	Targets: None					
	Systems being Trained/Te	sted: None				
Standard	Vessel safety	Typical Loca	ations			
Operating	Unmanned aerial and	Range Com	plexes/Testir	ng	Inland Waters/Pierside:	
Procedures	underwater vehicle	Ranges:	•		None	
(Section	procedures	Mariana Isl	ands Training	gand		
2.3.3)		Testing Stu	_			
Stressors to	Acoustic:		sturbance an	d Strike:	Energy:	
Biological	Vessel noise	Vessel and	in-water devi	ices	None	
Resources		Seafloor de				
	Explosive:	Ingestion:		Entanglement:		
	None	None		None		
Stressors to	Air Quality:	Sediments and Water Quality:				
Physical	Criteria air pollutants	None				
Resources						
Stressors to	Cultural Resources:	Socioeconomic Resources: Public Health and Safety:				
Human	None	Accessibi			Underwater energy	
Resources			acoustics		In-air energy	
		Physical	disturbance a	nd strike	Physical interactions	
Military	Ingestible Material:	,	Military	None	,	
Expended	None		Recoverable	e		
Material			Material			
	Non-Ingestible Material:					
	None					
Sonar and	None					
Other						
Transducer						
Bins						
Explosive	None					
Bins						
Procedural	Physical Disturbance and S	trike Stresso	rs: (Section 5.	3.4)		
Mitigation	Vessel movement					
Measures						

Acoustic and C	Acoustic and Oceanographic Science and Technology		
Acoustic and Oceanographic Research			
Assumptions	Approximately 12 non-recoverable bottom moorings may be used.		
Used for			
Analysis	Any sonar transducers used would be <i>de minimis</i> .		