BY ORDER OF THE COMMANDER
TYNDALL AIR FORCE BASE

TYNDALL AIR FORCE BASE
INSTRUCTION 21-214

12 MARCH 2026

HYDRAZINE (H-70) FAMILIARIZATION TRAINING, LEAK DETECTION, SPILLS, AND RECOVERY OF AIRCRAFT WITH FIRED/ACTIVATED EMERGENCY POWER UNITS

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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This instruction implements Department of the Air Force Instruction (DAFI) 21-101, *Aircraft and Equipment Maintenance Management*, Technical Order (TO) 42B1-1-18, *General Procedures Handling of H-70 (Hydrazine – Water Fuel)*, and TO 1F-16()-2-49GS-00-1, *Organizational Maintenance Emergency Power System*. It provides guidance and procedures on Hydrazine (H-70) familiarization training, leak detection, spills, and recovery of aircraft after operation of the Emergency Power Unit (EPU)/Emergency Start System (ESS). It applies to individuals at all levels who are Hydrazine Response Team (HRT) member and/or works with or in the vicinity of aircraft that uses H-70 to include units and/or personnel assigned, attached/tenant, transient, or deployed to Tyndall AFB, including all uniformed members of the Regular Air Force, Air Force Reserve and Air National Guard, except where noted otherwise, all DAF civilian employees, and those with a contractual obligation to abide by the terms of issuances. Refer recommended changes and questions about this publication to the office of primary responsibility (OPR) using the DAF Form 847, *Recommendation for Change of Publication*; route DAF Forms 847 from the field through the appropriate functional chain of command. This publication may be supplemented at any level, but all supplements must be routed to the OPR of this publication for coordination prior to certification and approval. The authorities to waive wing/unit level requirements in this publication are identified with a Tier ("T-0, T-1, T-2, T-3") number following the compliance statement. Submit requests for waivers through the chain of command to the appropriate Tier waiver approval authority, or alternately, to the publication OPR for non-tiered compliance items.

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SUMMARY OF CHANGES

This instruction has been revised. This revision includes changes throughout and must be completely reviewed. The major changes include the addition of roles and responsibilities and requirements established in the TO 42B1-1-18.

Chapter 1

PROGRAM OVERVIEW AND OTHER COMPLIANCE AREAS

1.1. Introduction. In situations where the HRT leader determines this instruction does not adequately cover procedures for a particular situation, or when safety of personnel or damage to equipment is involved, a waiver request will be submitted to the 325 FW/CC or delegate for review/approval.

1.2. Definition of Hydrazine. Hydrazine is a clear and colorless, extremely flammable liquid with an ammonia-like odor that is highly reactive and corrosive, as well as toxic by inhalation, ingestion, and skin absorption. **WARNING:** Non-essential personnel must leave the immediate area, up wind, if possible, to avoid breathing hydrazine vapors. Failure to do so may result in personal injury. Personnel will exercise care to ensure that hydrazine does not come in contact with skin or eyes. All EPU activations and suspected hydrazine leaks will initially be treated as definite leaks until the HRT determines otherwise.

1.3. Hydrazine Training.

1.3.1. All aerial targets contractor, aircraft maintenance, Transient Alert, and aircraft fuel systems personnel will receive familiarization training in the hazards of hydrazine. All unit commanders will ensure that personnel with duties in proximity of F-16, QF-16, U-2S/T aircraft, or hydrazine also receive training.

1.3.2. The Biohazard will provide initial hydrazine familiarization general awareness for all 325 FW personnel during mission orientation.

1.3.3. The 325 CES (EOD), 325 OMRS, and 325 CES (CEF) will provide in shop specialized training as required.

1.3.4. Contractor and deployed units will provide hydrazine familiarization and specialized HRT training in accordance with contract and home base policy.

1.4. Units with Hydrazine equipped aircraft Deploying/Temporary Duty (TDY) to Tyndall AFB requirements.

1.4.1. Will have the minimum amount of qualified personnel as HRT member (3 personnel).

1.4.2. Units will need to bring an approved hydrazine detection unit, spill kit, hydrazine tank container, and personnel protective equipment (PPE) (i.e. suits, gloves, respirators).

1.5. Designated Areas.

1.5.1. Recovering Aircraft with an EPU Activation: The primary aircraft recovery area is the intersection of taxiways Bravo, Delta and Golf. The secondary aircraft recovery area is taxiway Juliet (see **Attachment 2**).

1.5.2. Routine EPU Maintenance: Hydrazine maintenance areas are located on the designated aircraft parking area in the Bravo-Foxtrot North intersection (see **Attachments 4** & 5) and the trim pad on the northeast end of the drone runway (see **Attachment 3**). These areas will be utilized for temporary storage of the H-70 tanks after removal, purge and hookup procedures, and mono-propellant checks on the EPU system.

1.5.3. Authorized Storage Area: Building 96, (see **attachment 5**), will be the only facility on Tyndall AFB authorized for the storage of hydrazine. This facility is only authorized to store hydrazine cylinders in approved storage/shipping containers.

1.6. Evacuation/Cordon Distance.

1.6.1. When an H-70 leak or activation is suspected, personnel will establish safety cordons in accordance with the following procedures. While Technical Order 42B1-1-18 requires a minimum 150-foot radius, Tyndall AFB personnel will maintain an enhanced safety perimeter of 300 feet in all directions under normal wind conditions. When winds exceed 20 knots, the cordon distance will be increased to 600 feet in all directions. These initial cordon distances will be maintained until the aircraft is declared fire-safe by emergency response personnel. After emergency personnel have declared the aircraft fire-safe, the cordon may be reduced but will maintain a minimum distance of 300 feet downwind from the aircraft and 150 feet upwind and to the sides. These reduced distances account for wind dispersion patterns while ensuring continued personnel safety during post-emergency operations

1.6.2. If a spill is inside a hangar, evacuate the hangar and surrounding buildings. The Incident Commander (IC) may adjust the cordon based on conditions and hazards present, but no closer than 150 feet from the entrance.

Chapter 2

ROLES AND RESPONSIBILITIES

2.1. Individuals. In an event an individual discovers and/or witnesses an H-70 leak/spill (i.e. a clear, oily liquid coming from an aircraft detects the presence of an ammonia odor) and/or activation will:

2.1.1. Immediately evacuate the area as prescribed in **para 1.6**.

2.1.2. Call 911 with the most expeditious means possible and seek immediate medical attention. Notify the Emergency Operation Center (EOC).

2.1.3. Notify the Maintenance Operations Center (MOC) of suspected H-70 leak/spill site.

2.2. The 325 MXG/MXOC (Maintenance Operations Center), upon notification of an in-flight or ground emergency involving hydrazine, will:

2.2.1. Immediately announce the emergency over all radio networks.

2.2.2. Direct all maintenance vehicles to maintain clear distance from the suspected leak/spill location and restrict radio traffic to essential personnel only.

2.2.3. Notify Tyndall AFB Fire Emergency Services to ensure appropriate emergency response personnel are dispatched.

2.2.4. Contact the owning unit's Production Superintendents of an EPU/ESS activation or suspected hydrazine leak/spill. The owning unit's Production Superintendents will in turn contact and dispatch their HRT. **Note**: The contact for QF-16 aircraft will be the 82 Aerial Targets Squadron (ATRS) aerial targets contractor Production Supervisor. The contact for F-16 aircraft deployed to the 53 Weapons Evaluation Group (WEG) will be the 83 Fighter Weapons Squadron (FWS) Production Supervisor.

2.2.5. For Major Spills (1 liter or more), interface with all agencies responsible for disaster preparedness, fire protection, security and medical support.

2.3. The 325 CES/CEF Senior Fire Officer will:

2.3.1. Notify Tyndall Air Traffic Control (ATC) Tower to activate the Primary Crash Phone network.

2.3.2. Assume the role of the Incident Commander (IC) and perform all required actions assigned to the IC.

2.3.3. Establish cordons per **para 1.6**, with an entry control point (ECP) upwind of the aircraft.

2.3.4. Appoint an ECP monitor to ensure all personnel working on the scene check-in prior to entering area.

2.3.5. Egress all personnel including pilots and maintenance personnel from the cockpit and provide the individuals with a portable oxygen bottle when hydrazine is suspected of being present.

2.3.6. Provide a water source for dilution/neutralization of hydrazine for personnel decontamination of HRT members.

2.3.7. If a spill is inside a hangar, evacuate the hangar and surrounding buildings and may adjust the cordon based on conditions and hazards present, but no closer than 150 feet from the entrance.

2.3.8. Post four hydrazine caution signs around the cordon area.

2.4. QF-16s: The 53 WEG/CM, Contractor Program Manager or designated representative will:

2.4.1. Ensure the HRT performs inspections and conducts containment, dilution, and neutralization actions as required in applicable directives.

2.4.2. Ensure the HRT members are provided with proper PPE, chemicals and materials for inspection, identification, and neutralization of hydrazine.

2.5. The325 CES/CED (Explosive Ordnance Disposal). In the event of an aircraft crash, and if the ordnances are on board the aircraft, and a hydrazine leak is detected, provide a team to render any munitions "safe" at the direction of the IC.

2.6. The 325 CES/CEIE (Environmental Element) will:

2.6.1. Provide technical guidance and advice to the IC on issues related to implementing the Tyndall AFB Spill Response Plan, including the location and quantities of reserve spill response supplies/materials.

2.6.2. Provide technical guidance and advice to the IC on issues related to disposal of waste.

2.7. The 325 OMRS/SGXB (Bioenvironmental Engineering) will:

2.7.1. Advise the IC and provide guidance to the spill response team on health effects and protective equipment requirements.

2.7.2. Provide technical assistance in the neutralization of hydrazine.

2.7.3. Assist in investigations of personnel exposures to hydrazine resulting from EPU/ESS activations, leaks or spills.

2.8. The 325 SFS (Security Forces) will:

2.8.1. Evacuate the area to a distance prescribed in **para 1.6** and establish a cordon determined by the IC. If spills are inside a hangar, evacuate the hangar and any adjoining offices, and suspend all maintenance.

2.8.2. Allow only those personnel into the area that are approved by the IC.

2.9. The 325 FW/SE will:

2.9.1. Monitor operations from outside designated perimeter until the scene is mitigated for investigation. During Weapons Systems and Evaluation Program operations the **53 WEG/SE** will assume these responsibilities for WSEP aircraft and QF-16s only.

2.9.2. Assist commanders in investigating and reporting all incidents or mishaps involving Hydrazine IAW DAFI 91-204, *Safety Investigations and Reports*. During Weapons Systems and Evaluation Program operations the **53 WEG/SE** will assume these responsibilities for WSEP aircraft and QF-16s only.

2.10. The Aerial Targets Contractor HRT (QF-16) and deployed units' HRT (F-16) will:

2.10.1. Dispatch their HRT to the site of the EPU activation, suspected leak, or spill. **WARNING:** Per T.O. 1F-16( )-2-49GS-00-1… Maximum protective safety gear (level A or modified level B) is required for investigating a suspected or confirmed hydrazine leak.

2.10.2. After the IC has ensured aircraft is safe, inspect the aircraft for hydrazine contamination by the most appropriate means (visual, litmus paper, Drager multi-gas detector).

2.10.3. If hydrazine contamination is confirmed, notify Maintenance Operations Center (MOC) and the IC that a confirmed leak/spill exists and if it is minor (less than one liter) or major (more than one liter).

2.10.4. Perform cleanup/neutralization procedures.

2.10.5. Provide situation updates to the IC.

2.11. The 325 MXS/Transient Alert (TA) will:

2.11.1. Be responsible for providing hydrazine leak detection services for transient alert aircraft (i.e. F-16 and U-2).

2.11.1.1. If hydrazine system activation/leak is suspected of an inbound transient/divert aircraft, ensure aircraft is recovered in a pre-designated hydrazine location (see Attachments **2-5**). Determine the extent of the leak and provide the extent of the leak to the IC.

2.11.1.2. If an aircraft is suspected to have a hydrazine leak and is parked in a populated area, determine the extent of the leak, evacuate personnel in the vicinity per **para 1.6**. Then contact emergency personnel and the Maintenance Operations Center (MOC). Maintain a temporary cordon until emergency personnel can establish one per **para 1.6**.

2.11.1.2.1. Assist TDY unit with towing aircraft to designated hydrazine maintenance area if tow crosses Controlled Movement Area (CMA).

2.11.2. Contact home station or assist aircrew in establishing communications with the aircraft owning agency/home station.

2.11.3. Notify the owning unit/organization that they will be responsible to coordinate hydrazine response, repair of hydrazine system, and spill clean-up.

Chapter 3

HYDRAZINE PROCEDURES AND HANDLING

3.1. Hydrazine Leak or Suspected Leak for Hangered or Parked Aircraft.

3.1.1. The HRT will don PPE, and two members will verify if a hydrazine leak has occurred.

3.1.2. If no hydrazine leaks are detected, the HRT team leader will inform the IC and 325 MXG/MOC.

3.1.3. If a hydrazine leak is detected, the HRT will perform the following:

3.1.3.1. The HRT team leader will inform the IC and 325 MXG/MXOC of leak.

3.1.3.2. Two members will open access panels to locate the source of the leak, while the team leader acts as a safety observer and back-up for the other two members.

3.1.3.3. Depressurize the hydrazine tank, contain the leak, and perform cleanup/neutralization procedures.

3.1.3.4. Once the spill has been contained and neutralized, the HRT will test aircraft and the surrounding area for residual presence of hydrazine. If the area is determined to be safe, the aircraft will be towed to the hydrazine maintenance/service area and the EPU/ESS system returned to operationally ready status in accordance with the applicable TOs.

3.2. Procedures for Hydrazine System activation with & without Visual Hydrazine Leak Detected.

3.2.1. Once EPU/ESS activation has been confirmed by the fire department, the IC will perform the following:

3.2.1.1. Inform the control tower of hydrazine system activation.

3.2.1.2. Chock the aircraft, if not already chocked.

3.2.1.3. Have the pilot/maintenance engine run personnel ensure the EPU is placed in the “off” position and then will pin the EPU.

3.2.1.4. Coordinate engine shutdown with the personnel in the cockpit before egressing from cockpit using a portable oxygen bottle.

3.2.1.5. If weapons are on board, ensure the weapons are safe as required.

3.2.1.6. Determines the aircraft has been made safe and the cordon has been reduced to 300 feet downwind and 150 feet upwind and to the sides with controlled unfettered access to aircraft, he directs the HRT to investigate the aircraft for possible hydrazine leak.

3.2.2. If it has been confirmed that no hydrazine is detected, the HRT Team Leader will perform the following procedures for EPU activation without hydrazine detected:

3.2.2.1. Inform the IC that there is no hydrazine detected and direct the IC to inform the control tower there was no hydrazine detected.

3.2.2.2. Depressurize the hydrazine tank.

3.2.2.3. If hydrazine is not detected during depressurization, the aircraft will be towed to hydrazine maintenance and servicing area and the EPU/ESS system returned to operationally ready status in accordance with the applicable TOs.

3.2.3. If hydrazine is detected, the HRT will perform the following procedures for EPU activation:

3.2.3.1. Inform the IC of the detected hydrazine and direct the IC to inform the control tower of the contaminated area.

3.2.3.2. Depressurize the hydrazine tank, contain the leak, and perform cleanup/neutralization procedures.

3.2.3.3. Once the spill has been contained and neutralized, test aircraft and the surrounding area for residual presence of hydrazine. If the area is determined to be safe, the aircraft will be towed to the hydrazine maintenance/service area and the EPU/ESS system returned to operationally ready status in accordance with the applicable TOs.

3.3. Hydrazine Exposure. Procedures in the event of personnel being exposured to H-70:

3.3.1. Exposed personnel will be isolated in an area upwind and away from the contaminated area and will need to undergo medical evaluation.

3.3.2. Personnel who are exposed to H-70 on their skin or clothing will proceed to the nearest source of water.

3.3.2.1. Clothing: Immediately remove all clothing and flush affected skin area with water for a minimum of 15 minutes. Contaminated clothing will be neutralized by the HRT and disposal will be coordinated with Bioenvironmental Engineering and the Civil Engineering Environmental Element.

3.3.2.2. Eyes: Immediately flush with large amounts of water for a minimum of 15 minutes. Transport to hospital emergency room.

3.3.2.3. Inhalation: Seek medical evaluation from the medical response team and transport to hospital emergency room.

3.3.3. The HRT will properly neutralize and turn in all contaminated clothing and unserviceable equipment to 325 CES/CEAN for proper disposal.

3.4. Hydrazine Servicing and Storage.

3.4.1. Servicing: Hydrazine servicing will not be accomplished at Tyndall AFB. Hydrazine tanks requiring service will be transported to Eglin AFB, FL for appropriate maintenance.

3.4.2. Storage: Location of operation: **Building 96**

3.4.3. Safety precautions:

3.4.3.1. The storage facility will be identified by the appropriate chemical agents, signs, and placards mounted to all four sides of the building (fence, if installed) and easily visible from all directions in accordance with TO 42B1-1-18.

3.4.3.2. Only hydrazine trained personnel or those who have received Hydrazine Familiarization training will access building 96. Untrained individuals will only enter if

escorted. F-16 TDY units will report needs through appropriate 325 FW managers (MX Ops Mgr, CKF DD) or 53 WEG leadership.

3.4.4. Hydrazine storage limits: Servicing facility documents contain local requirements for the storage of drums. H-70 will be stored as a special commodity because it is corrosive, toxic, and combustible. H-70 does not meet the criteria for an explosive as defined by DESR6055.09_DAFMAN91-201 *Explosive Safety Standards*; however, the separation distance between H-70 and explosives is provided therein. Minimum separation distance between H-70 storage and oxidizer (e.g. liquid, gaseous oxygen) storage shall be in accordance with 42B1-1-18 Table 2-1.. The larger quantity of the two products to be separated shall be used to determine the separation distance. H-70 should not be stored within 100 feet of public traffic routes, inhabited buildings, civilian or government leasing areas, or public facilities such as schools and churches.

3.5. Transportation of Hydrazine Fuel Tanks On/Off Base.

3.5.1. Safety Procedures:

3.5.1.1. Transportation of hydrazine tanks will be held to a minimum.

3.5.1.2. All tanks either empty or containing any amount of hydrazine, will be transported in the approved shipping container only.

3.5.1.3. The transport vehicle will carry ***no more than*** two full hydrazine tanks at any given time.

3.5.2. While transporting, aggregate weight (tank, H-70 and container) cannot exceed 440 pounds; approximately two full hydrazine tanks with container or three purged tanks with container.

CHRISTIAN M. BERGTHOLDT, Colonel, USAF
Commander

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

AFMAN 32-322, *Records management and information Governance Program*, 22 March 2020

AFPD 21-1, *Maintenance of Military Material,* 21 February 2024

DAFI 91-204, *Safety Investigations and Reports*, 10 March 2021

DESR6055.09_DAFMAN91-201, *Explosives Safety Standards*, 18 June 2025

T.O. 1F-16( )-2-49JG-00-1, *Emergency Power System*, 1 September 2022

T.O. 42B1-1-18, *General Procedures Handling of H-70 (Hydrazine - Water Fuel),* 1 June 2020

Abbreviations and Acronyms

AFRIMS—Air Force Records Information Management System

ATC—Air Traffic Control

CED—Civil Engineer Directorate

CEF—Civil Engineering Flight

CEIE—Environmental Management

CES—Civil Engineering Squadron

DAFI—Department of the Air Force Instruction

DOT—Department of Transportation

ECP—Entry Control Point

EOC—Emergency Operation Center

EOD—Explosive Ordinance Disposal

EPU—Emergency Power Unit

ESS—Emergency Start System

FW—Fighter Wing

H-70—Hydrazine

HRT—Hydrazine Response Team

IAW—In Accordance With

IC—Incident Commander

MAJCOM—Major Command

MXOC—Maintenance Operations Center

OMRS—Operational Medical Readiness Squadron

OPR—Office of Primary Responsibility

PPE—Personal Protective Equipment

RDS—Records Disposition Schedule

SFS—Security Forces Squadron

SGXB—Bioenvironmental Engineering Flight

TO—Technical Order

WEG—Weapons Evaluation Group

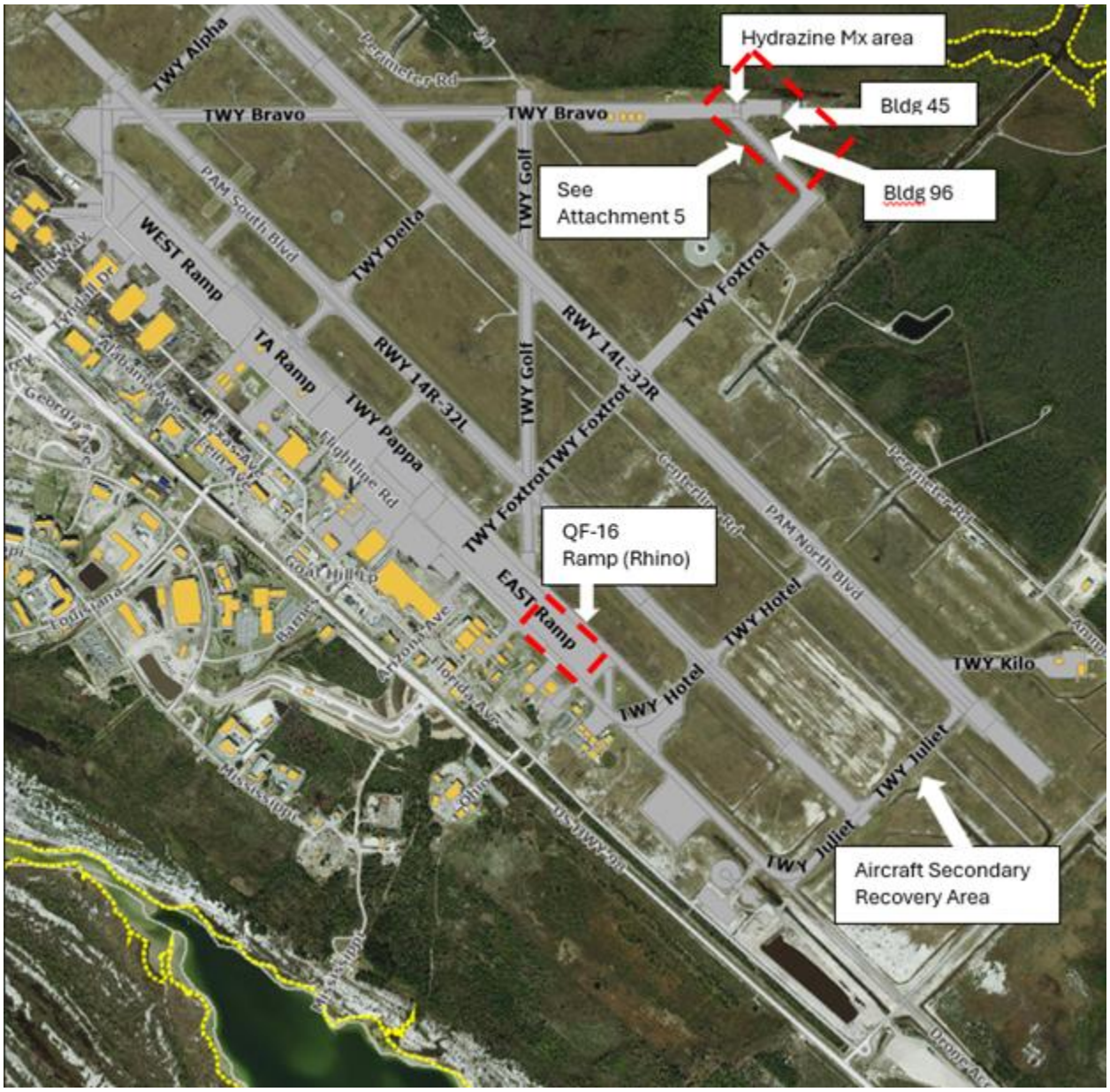
WEG/CM—Weapons Evaluation Group Program Manager

Attachment 2

VIPER RAMP/MAIN AIRFIELD

A2.1. Map of Viper Ramp and Main Airfield.

Figure A2.1. Map of Viper Ramp and Main Airfield.



Attachment 3

9310 AREA/DRONE RUNWAY

A3.1. Map of Building 9310 and Drone Runway.

Figure A3.1. Map of Building 9310 and Drone Runway.

Attachment 4

DRONE RUNWAY HYDRAZINE MAINTENANCE AREA

A4.1. Map of Hydrazine Area on the Drone Runway.

Figure A4.1. Map of Hydrazine Area on the Drone Runway.

Attachment 5

BRAVO-FOXTROT NORTH (SWAMP) HYDRAZINE MAINTENANCE AREA/BLDG 45 & BLDG 96

A5.1. Map of Bravo-Foxtrot North Hydrazine Maintenance Area.

Figure A5.1. Map of Bravo-Foxtrot North Hydrazine Maintenance Area.