

**SUPERFUND TECHNICAL ASSESSMENT RESPONSE TEAM
STANDARD OPERATING PROCEDURE FOR RECONNAISSANCE OF
ELECTRIC VEHICLES
2023 MAUI WILDFIRE RESPONSE
OCTOBER 27, 2023**

1. OBJECTIVE

This Standard Operating Procedure (SOP) describes the process to determine the presence and location of hybrid and electric vehicles (EVs) impacted by the 2023 Maui Wildfires. Identification of EVs in a burn zone is necessary to ensure the proper handling and recycling/disposal of lithium ion and nickel-metal hydride batteries. The objective is to identify and log all hybrid and EVs within the burn zone. This includes vehicles with partial or no visible impacts by fire since temperatures as low as 150 degrees fahrenheit can compromise the batteries. The purpose of the battery reconnaissance (recon) is to:

- 1) Understand the scope of the EV project and collect specific data in the site database which can then be queried for information;
- 2) Assist the battery recovery process;
- 3) Inform EPA's discussions of the disposition of EVs with interested third parties such as owners, insurance companies, local police and city officials, local auto recovery companies;
- 4) Plan battery processing activities; and
- 5) Plan disposal/recycling of EV batteries.

The Battery Recon Team will be followed by the Battery Removal Team which will be responsible for assessing the condition of the vehicle and the battery, if the battery should be removed, or if the owner of the vehicle or insurance company should be contacted (e.g., if the vehicle appears not to be impacted). The Battery Recon Team will typically be made up of 2-3 START personnel with oversight by a Federal On-Scene Coordinator. The Battery Recon Team is part of the EV Task Force.

2. SUMMARY OF METHOD

Recon is done by a team of trained hazmat responders familiar with vehicle manufacturers, models, and mechanical and battery technology. Teams will survey burned areas looking for vehicles with either hybrid or all electric drivetrains. Once a vehicle is positively identified with hybrid or EV technology, it is marked physically with paint or grease pencil, with a blue colored lightning bolt (typically paint can be used on burned vehicles and the grease pencil on non-burned vehicles on the windshield or glass) and digitally entered into electronic field collection and mapping software (QuickCapture via Field Maps). Additional methodology can be found in the *Maui*

Wildfires 2023 Damaged Lithium-Ion Battery Management Guide for Electric Vehicles & Mobility Devices.

3. HEALTH & SAFETY

Qualified personnel should have completed adequate training to enter a disaster area, including HAZWOPER, OSHA, site-specific safety, and cultural training. Many hazards exist when performing reconnaissance of burned vehicles. Some of these hazards include sharp edges, broken glass, puncture hazards, structurally unsafe walls, beams, and roofs, high voltage hazards, toxic dust, compromised trees, heat/cold stress, and many more. The recommended PPE for this task is: long pants and shirt, hardhat, safety toe boots with steel shank, cut resistant gloves, eye protection, high visibility vests, and a dust mask or respirator. Higher level PPE such as Tyvek and boot covers is recommended when conditions require entry into ash footprints. Refer to the Health and Safety plan located on the 2023 Maui Wildfires Teams page, Section 1.6 Safety Officer for additional precautions.

4. GENERAL RECON PROCEDURES

1. Locate regions or areas of concern via mapping software, usually target areas will be conveyed via management or an operations lead. Locations of properties may also be supplied by other parties such as Maui County, self-assessment forms, Hotline calls, insurance companies, motor vehicle agencies, etc.
2. Observe every vehicle in the area. Use clues to quickly eliminate certain vehicles from being potential EVs. For example, vehicles older than 20 years are unlikely to contain battery technology. Having a good understanding of manufacturers is key to identify possible EVs and hybrids. It can be challenging to identify burned vehicles. Observe the silhouette of the body to identify or narrow down the vehicle make and model. If a vehicle is suspected to be a possible EV or hybrid a closer look is needed.
3. Mark the EV vehicle with an EV/hybrid identification mark. For this project, a blue lightning bolt should be painted on the driver and passenger doors, if no doors are present then mark on the front quarter panels and/or trunk and hood. If the vehicle is in the requested survey zone but little to no visible damage is present, do not mark the car with paint; rather use a blue grease pencil to mark the windshield with a blue lightning bolt. The recon team does not make the determination if a battery is to be removed, rather they solely identify the batteries in the area of concern and current conditions. Determination of battery removal processes, including applicability, will be determined by the Battery Removal Team.

4. Log the EV into the parcel universe: Open Field Maps, select the “+” on the bottom right of the screen to access QuickCapture (do not open QuickCapture directly. Only enter data via Field Maps). Place the point as accurately as possible, take a photo, enter all available information (make, model, license plate, VIN), and select vehicle status. Status definitions are as follows:

- Needs Assessment – a burned EV that has been identified but not yet processed by battery removal team
- Complete – An EV that has been processed by the battery removal team
- Deferred – An EV that cannot have its battery removed due to technical issues such as safe access
- Archived – An EV that has been moved or removed (not by EPA) since marked as “Needs Assessment”; vehicle is no longer there
- Follow Up Required – An EV that cannot have its battery removed without EPA leadership approval. Typically, EVs in the burn zone with minimal to no observed fire and/or heat damage.
- Not In Universe – An EV that was not located, confirmed to not be an EV, or will not have its battery removed per EPA leadership.

Lists from various entities including County offices, local police departments, the National Insurance Crime Bureau, insurance representatives, and tow companies may be able to assist with identification of vehicles located in the burn areas. These lists can be used to contact owners, determine EV and hybrid vehicles, or QA/QC the reconnaissance operation.

EV and Hybrid Vehicle Identification Notes:

- Common EVs are the Tesla Model S, Tesla Model 3, Nissan Leaf, Chevy Bolt, Volkswagen ID.4, and numerous lithium-ion battery powered golf cart or recreational style vehicles.
- Common plug-in hybrid vehicles are the Chevy Volt, Kia Niro plug-in hybrid, Lexus NX plug-in, and Ford Escape plug-in hybrid.
- Common hybrid vehicles are the Toyota Prius, Toyota Rav-4 hybrid, Toyota Sienna hybrid, Honda Insight, Honda CRV hybrid, Subaru Crosstrek hybrid, Ford Escape hybrid, and Ford Fusion hybrid.
- Hybrid and fully electric vehicle batteries can be located in trunks, behind rear passenger seats, underneath driver and/or passenger seats, or located underneath the vehicle.

- A high voltage charge port in lieu of a fuel filler location will indicate a fully electric vehicle. Charge ports can be in the front of a vehicle, in front of the driver door in the front quarter panel, rear driver quarter panel, or rear passenger quarter panel. A vehicle with both a fuel filler location and a high voltage charge port will indicate a plug-in hybrid vehicle. Charge ports can be differentiated from fuel filler necks due to their high voltage cables and lack of a physical pipe running to a fuel tank.
- The absence of a gas motor can often be an indication of an electric vehicle. Check the rear of a vehicle as well, as some manufacturers install rear mounted gasoline engines. Even after a severe fire, a gasoline or diesel engine has distinguishing characteristics such as exhaust manifolds, catalytic converters, ignition coils, camshafts, and crankshafts. A full EV does not have these components. A hybrid vehicle will have those components. Further inspection of the transaxle is needed to identify the presence of an electric motor.
- Clues such as VIN number or a license plate can be used to search vehicle make/model/year online. **Faxvin.com** is a free license plate and VIN search tool. Many of the burned vehicles have no identification on them, so this step cannot be used. License plates fall to the ground when a composite or plastic bumper burns. If the insurance company has inspected the vehicle, they often write the VIN number on it.



Electric Golf Cart with Lithium-Ion Battery Pack



Toyota Prius battery pack located behind rear seat.



Toyota Sienna hybrid engine bay. Note electric motor components above transaxle coupled with typical 4-cylinder gasoline engine.



Nissan Leaf full electric vehicle engine bay. Note none of the components of a gasoline engine can be distinguished.



Volkswagen Golf Non-Hybrid Non-Electric engine bay.



Toyota Prius with no visible burn evidence but located in survey zone. Note: plants and structures unburned nearby.



Ford F150 Lightning with visible heat damage. Taillights melted, wheel wells melted, discoloration of paint, plastic trim melted. Nearby structure fire.

Electrical Vehicle Status Guide

The entire universe of this data set is electric vehicles identified by the EV Team.



Needs Assessment – An electric vehicle that has been identified, but not yet processed by removal team.



Complete – An electric vehicle that has had its battery recovered.



Deferred – An electric vehicle that cannot have its battery removed by EPA due to technical issues, such as the inability to access the vehicle safely.



Archived – An electric vehicle that has been moved since a "Needs Assessment" point was created.



Follow Up Required – An electric vehicle that cannot have its battery recovered without EPA leadership's decision.



Not in Universe – After "Follow Up Required" resolution, an electric vehicle that will not have its battery recovered as decided by EPA leadership; or EV battery not found at location.