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Blythe Solar Power Project
Flood Safety Plan

FEBRUARY 2016

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APPENDICES

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1 INTRODUCTION AND PURPOSE

This Flood Safety Plan (FSP) has been prepared for use during operation and maintenance activities at the Blythe Solar Power Project (BSPP) in Blythe, California. The BSPP is located approximately 13 miles northwest of the City of Blythe, in unincorporated eastern Riverside County, California.

The purpose of this FSP is to inform BSPP employees of potential hazards associated with flooding and to meet the requirements of Condition of Certification (COC) WORKER SAFETY-2 which states the following:

The project owner shall submit to the CPM a copy of the Project Operations and Maintenance Safety and Health Program containing the following:

- *An Operation Injury and Illness Prevention Plan;*
- *An Operation heat stress protection plan that implements and expands on existing Cal OSHA regulations (8 CCR 3395);*
- *A Best Management Practices (BMP) for the storage and application of herbicides;*

An Emergency Action Plan that includes safety measures, engineering controls, and BMPs to address potential electrical shock hazards in the event of fire;

- *Hazardous Materials Management Program;*
- *Fire Prevention Plan;*
- *An Operations Flood Safety Plan; and*
- *Personal Protective Equipment Program (8 Cal Code Regs, §§ 3401-3411).*
- *The Operation Injury and Illness Prevention Plan, Emergency Action Plan, Heat Stress Protection Plan, BMP for Herbicides, and Personal Protective Equipment, an Operations Flood Safety Plan, and Personal Protective Equipment Program shall be submitted to the CPM for review and comment concerning compliance of the programs with all applicable safety orders. The Fire Prevention Plan and the Emergency Action Plan shall also be submitted to the Riverside County Fire Department for review and comment.*

The National Oceanic and Atmospheric Administration (NOAA) defines "flood" to be "an overflow of water onto normally dry land." In the context of the BSPP, flooding risk is almost

entirely limited to the risk of flash floods, defined as "a flood caused by heavy or excessive rainfall in a short period of time, generally less than 6 hours. They can occur within minutes or a few hours of excessive rainfall." (NOAA 2010).

1.1 Site Description

The BSPP is located adjacent to the northern section of Dracker Drive, approximately 13 miles northwest of the city of Blythe, Riverside County, California (see Figure 1). The BSPP consists of an approximately 485 megawatt (MW) solar facility. Access is obtained via I-10, Black Rock Road and Dracker Drive. There are two points of ingress/egress to the BSPP along Dracker Drive that consist of a primary access point and a secondary access point (see Figure 1).

It is anticipated that approximately 20 full-time personnel will be employed at the BSPP. Temporary personnel would be employed, as needed, during seasonal periods.

1.2 Environmental and Hydrologic Setting

The BSPP is located in the alluvial-filled basin of the Palo Verde Mesa in eastern Riverside County, and the climate is classified as a "low desert," with high aridity and low precipitation. Surface water in Palo Verde Mesa drains to the southeast into the Palo Verde Valley floodplain. In the vicinity of the BSPP, the general surface water flow pattern trends from higher elevations in the McCoy Mountains into shallow moderately defined channels at the base of the mountains. From that point, storm water flows across alluvial fan systems that radiate from the base of the McCoy Mountains and mesa.

The major watercourse near the BSPP is the McCoy Wash (east of the BSPP) which drains approximately 210 square miles of the Palo Verde Mesa, McCoy Mountains, Little Maria Mountains, and Big Maria Mountains, and exits the mesa to the southeast of the BSPP. Measured flows in the McCoy Wash have reached as high as 4000 cubic feet per second, as measured in 1976 during flooding in the watershed (BLM 2012). Water runoff in the vicinity of the BSPP occurs only in response to infrequent intense rain storms. As opposed to many locations is California, where peak flows on rivers and creeks occur in the winter or early spring, the highest flows in the project area tend to occur in response to intense monsoonal rainfall, usually occurring between July and September.

Numerous moderately defined washes traverse the BSPP, trending west-to-east. To the west side of the BSPP, the washes are deeper, containing poorly sorted sediment and angular cobbles and boulders. To the east, the washes are typically shallow, and tend to be defined by well sorted sand and vegetation. The conveyance capacity of the washes is limited, and runoff during

moderate to large events would break out of these features and be conveyed across the alluvial fan as shallow sheet flow.

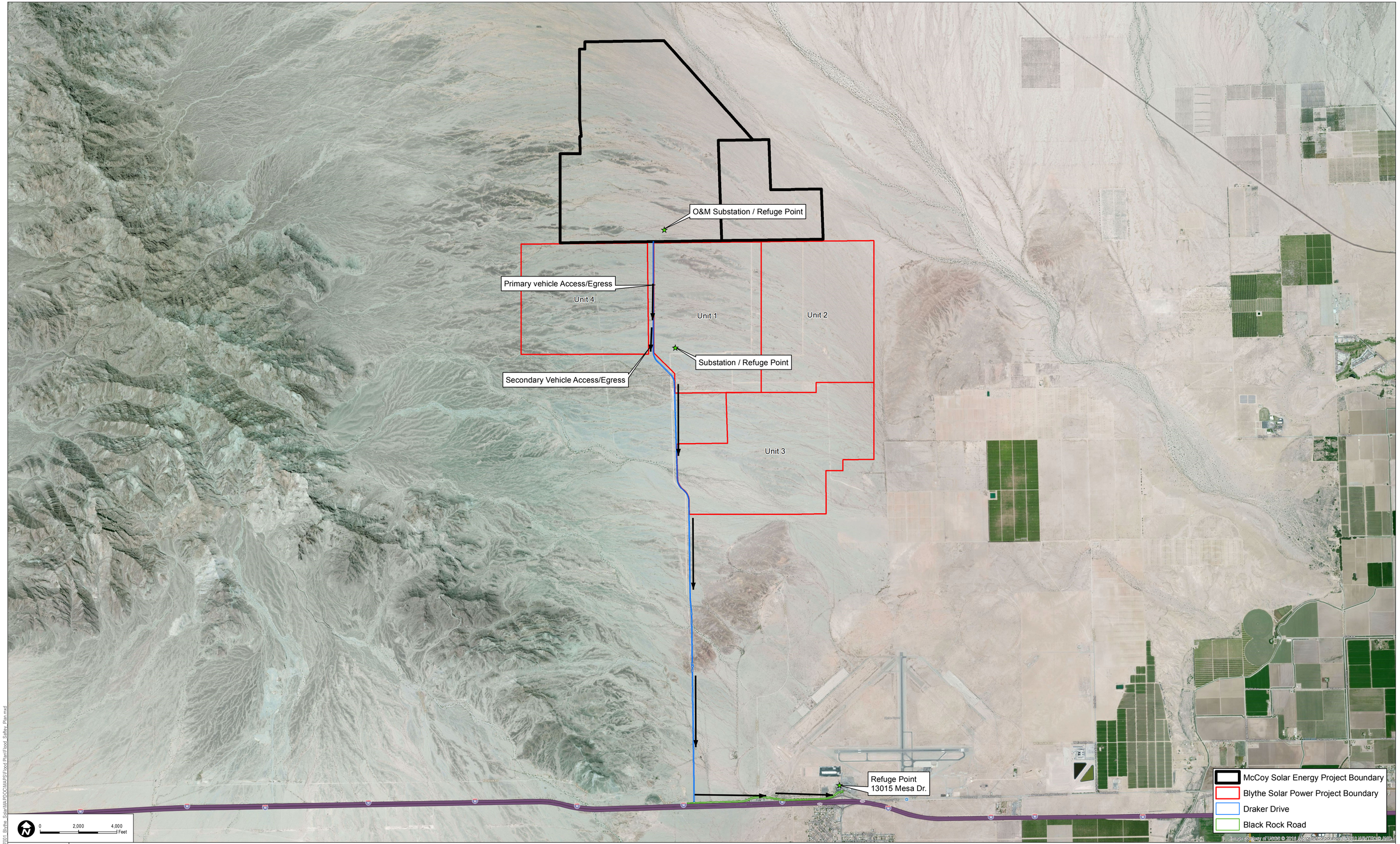

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Figure 1

Blythe Solar Power Project - Flood Safety Plan Exhibit

Blythe Solar Power Project

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2 ORGANIZATION AND ASSIGNMENT OF RESPONSIBILITIES

Leading up to or after a flood event, the following division of responsibilities should be in effect.

2.1 BSPP Manager

The Facilities Manager (FM) will establish overall policies and priorities for flood preparation and response. The FM may appoint a Flood Safety Officer (FSO) to conduct the appropriate monitoring and preparation measures, or may fulfill the role of FSO themselves.

2.2 Flood Safety Officer

The Flood Safety Officer (FSO) is responsible for:

- Monitoring weather reports per Phase I, Phase II or Phase III specifications described in Section 3
- Ensuring that flood preparation measures are enacted, and performing as-needed inspections using the Flood Safety Inspection form (Appendix B for an example) to evaluate maintenance needs of flood preparation measures
- Coordinating with the FM after a flood event to ensure that the BSPP is safe for work to proceed
- Tracking the number of employees and visitors on site, and accounting for all personnel in the event of an evacuation. The FSO shall have the information necessary for rapid communication with all BSPP employees, including temporary employees (e.g., cell phone numbers).
- Training new-hires prior to the commencement of work.
- Identifying the location and route to nearby medical facilities and emergency contact information and coordinating appropriate responses in the event of emergency.
- Posting a copy of the evacuation route and the route to the nearest medical BSPP in a designated area at the BSPP.
- The FSO shall review this FSP on a periodic basis to ensure all information contained herein is up to date (e.g., emergency contact information), and shall make revisions to the FSP as appropriate.

2.3 Support Personnel

Support Personnel are responsible for coordinating with the FSO to implement and maintain flood preparation measures. Additionally, Support Personnel may be asked to assist in clean-up activities after a flood event.

3 CONCEPT OF OPERATIONS

Flood safety measures are comprised of five phases: Normal Preparedness, Increased Awareness, Emergency Preparedness, Emergency Phase, and Recovery.

NOAA makes available several data products related to flood risk which the FSO may wish to review (e.g., the national map of active alerts on the National Weather Service home page at www.weather.gov). Two NOAA data products are especially relevant to flash flood risk at this BSPP: Flash Flood Watches and Flash Flood Warnings. A Flash Flood Warning "is issued when a flash flood is imminent or occurring," while a Flash Flood Watch "is issued when conditions are favorable for a specific hazardous weather event to occur it does not mean flooding will occur, but it is possible."

While Flash Flood Warnings should be noted by the FSO (see Section 5 Reference Websites), they may leave little or no time to prepare for a flood emergency. Thus, emergency preparedness measures should be in place before a Flash Flood Warning is issued.

3.1 Phase I: Normal Preparedness (Monitoring and Storage)

The FSO will check the one-week weather forecast weekly during the spring and fall, and daily during the summer and winter seasons (when the majority of precipitation is expected). The one-week forecast for Blythe, CA can be found at www.weather.gov by searching for "Blythe, CA." If there is a greater than 50% chance of precipitation within one week, the FSO will post a printed copy of the one-week forecast in a central location and alert all site employees. In addition to monitoring official weather forecasts online, the FSO should subscribe to a service that delivers email and SMS weather alerts alert and warning information, if available.

Hazardous materials should be stored in secondary containment in facilities that are not in danger of sustaining flood damage. BSPP flood damage should not be a significant concern as all structures on site have been designed to be at least 2 feet above the anticipated 100-year flood flow and protected from scour where needed.

Routine checks should be made of the effectiveness of water-proofing measures using a Flood Safety Inspection Form (see Appendix B for an example), and maintenance performed where necessary, per the HSP.

The following additional preparation measures should be followed:

- A fully-stocked emergency supplies kit (including water, food, a first aid kit, flashlight, battery-powered radio, emergency contact information, and other supplies as the FSO deems necessary) should be maintained on site in a designated location.
- An evacuation route, including an emergency assembly point, should be identified and a map of the evacuation route posted in a designated location (e.g., the main parking area or the entrance area of the O&M building). A preliminary evacuation route map and associated refuge points have been included in Figure 1.

A copy of this FSP will be made available to all personnel working at or visiting this BSPP. In addition, all persons working at or visiting the BSPP must sign in before entering the BSPP, in order to account for all employees after an evacuation (per CFR 29 1910.38). This can be accomplished by using a Site Entry Log form (Appendix A).

3.2 Phase II: Increased Readiness

Before the expected (summer and winter) precipitation seasons, a full inspection should be made of the washes, perimeter fences, and any other potential low water crossings using the Flood Safety Inspection Form (see Appendix B for an example). If they are obstructed by accumulated sediment, vegetation, woody debris, or other material that could impede flow, the obstruction should be cleared.

During the summer and winter, when the majority of precipitation is expected, the FSO will check the one-week weather forecast daily. Additionally, if no email or SMS alert service is available, the FSO will check NOAA Flash Flood Watches and Warnings daily (see Section 5 Reference Websites).

3.3 Phase III: Emergency Preparedness

There will be two triggers for Phase III emergency preparedness measures: 1) a NOAA Flood Watch is issued for the region of the BSPP, and 2) the weather forecast predicts a storm within 48 hours with a 50% or greater chance of precipitation.

If only one of these triggering events is present, partial Phase III measures should be implemented: weather forecast monitoring frequency should be increased to multiple times per day, and BSPP personnel should be put on alert that storm preparation measures may be necessary.

If both triggers are present, the following additional emergency preparedness measures shall be implemented.

- The FSO will confer with other managers to determine if a suspension of site activities and/or a full site evacuation is necessary, based on developing forecasts and NOAA warnings.
- Local radio stations should be monitored for weather condition updates in addition to NOAA data products.
- Equipment and materials should be moved to higher ground.
- Hazardous materials (e.g., fuel, transformer oil, etc.) should be secured within secondary containment.

Though the likelihood of severed electrical wires is low at the BSPP, care should be taken to ensure that all wires are secured. During a flood, if the soil or pavement surface is covered in shallow sheet flow, it is conceptually possible for a trailing wire to electrify large areas of ground, and an individual walking in shallow water could be subject to risk of electrocution at a distance.

3.4 Phase IV: Emergency Phase

If BSPP personnel find themselves on site in a flood situation which is dangerous, emergency evacuation measures should be followed. The primary objective when evacuating would be to avoid low areas where flow may accumulate.

If site evacuation via the designated evacuation route is impossible or would result in risk of personal injury or property damage, personnel should attempt to shelter in place on high ground. The major structures (e.g., O&M and Substation area) are designed to be at least 2 feet above the 100-year flood flow and protected from scour where needed, so it may be possible to shelter in these buildings (see Figure 1). Alternatively if an offsite evacuation is required, egress would occur via Dracker Drive to Black Rock Road where personnel would meet (see Figure 1).

After an evacuation, the FSO will take a head count. The group of evacuees will assist in identifying the names and last known locations of anyone not accounted for, and pass them to the FSO and FM.

Storms can develop in fewer than 15 minutes. When developing conditions are observed, (e.g., darkening skies, increasing wind, lightning, thunder, etc.) monitor local radio stations for weather condition updates. It is important to note that it doesn't have to be raining at the site in order for flash floods to occur.

Do not walk or drive through floodwaters as very little water is needed to sweep a vehicle away. Nearly half of flood fatalities are vehicle-related (OSHA 2014).

The National Oceanic and Atmospheric Administration (NOAA) recommends the following:

- **Listen** for roaring sounds upstream as flood waters may be present;
- **Look** for rapidly rising water and/or muddy water; and
- **Remember** to seek higher ground if you hear or see signs of a flood.

In the case of flood-related injury or property damage, emergency services should be notified (see Section 4.0 to this document).

3.5 Phase V: Recovery

Recovery activities may include:

- Removal of debris
- Clearance of roadways
- Repair of damaged fences, structures or utility lines

3.6 Emergency Information

BSPP Location Address: 13 miles northwest of the city of Blythe, California, on Dracker Drive.

Directions to BSPP: From I-10, take the Airport/Mesa Drive exit (Exit 232).

If traveling west, turn right after the off-ramp; if traveling east, turn left after the off-ramp.

Turn left at onto Black Rock Road.

Turn right onto Dracker Drive.

3.7 Emergency and Site Phone Numbers

Emergency Services (Fire, Ambulance, Police)	911
Poison Control	800.222.1222
Riverside County Sheriff's Department – Colorado River Station	760.921.7900
Riverside County Fire Department – Station 43 Blythe	760.921.7822
Hospital – Palo Verde Hospital	760.922.4115 250 N. 1st Street Blythe, California

4 REFERENCE WEBSITES

URLs for all reference websites were last accessed/verified on 9/18/2014.

Weekly Forecast

www.weather.gov

Search for "Blythe, CA"

NOAA Flood Warning

http://www.nws.noaa.gov/view/national.php?prodtype=flashflood

or

www.weather.gov, select "Flash Flood Warning" below the national weather alert map

NOAA Flood Watch

http://forecast.weather.gov/wwamap/wwatxtget.php?cwa=usa&wwa=Flash%20Flood%20Watch

or

www.weather.gov, select "Flash Flood Watch" below the national weather alert map

NOAA Turn Around Don't Drown ® Road Signs

http://www.nws.noaa.gov/os/water/tadd/road_signs.shtml

FEMA Basic Disaster Supplies Kit Instructions

http://www.ready.gov/kit

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5 REFERENCE DOCUMENTS

National Oceanic and Atmospheric Association (NOAA), 2010. Flood and Flash Flood Definitions. <http://www.srh.noaa.gov/mrx/hydro/flooddef.php> Page Last Modified 6/17/2010. Accessed 9/11/2014.

Occupational Safety & Health Administration (OSHA), 2014. Flood Preparedness and Response. <https://www.osha.gov/dts/weather/flood/index.html> Accessed 9/12/2014.

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APPENDIX A

Site Entry Log

APPENDIX A
Site Entry Log

Site Name: _____ Date: _____

Site Location: _____

	Name	Signature	Employer	Time In	Time Out
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

Reviewed:

_____ _____ _____

Health and Safety Supervisor (print) Signature Date

APPENDIX B

Flood Safety Inspection Form

Flood Safety Inspection Form

Name / Title of Inspector:	**Date:**
Site Name and Location:	**Time:**

Monthly Inspection

Electrical components are in good condition and waterproofed as necessary.	Yes	No
Hazardous materials are stored properly, containers are in good condition (e.g. no cracks/leaks) and stored in secondary containment.	Yes	No
Secondary containment of hazardous materials is in good condition.	Yes	No
The Emergency Supply Kit is stocked and items are in good working condition.	Yes	No
If no to any of the above, please explain.		
Note any other maintenance needs related to flood safety.		

Pre-Rainy Season Inspection (June and November)

Are there any obstructions, such as accumulated sediment, vegetation, or debris that could affect drainage of the facility in the following areas:

along fences?	Yes	No
in washes?	Yes	No
in other low areas?	Yes	No
in roads or water crossings?	Yes	No

If yes, note the location and nature of the obstruction:

Date repaired: Repaired by: