GeoSmart Information

FloodSmart FWEP

Flood Warning and Evacuation Plan

Site Address

Holden Clough Nurseries
Bolton by Bowland
Lancashire
BB7 4PF

Grid Reference

377384, 449484

Report Prepared for

John Metcalfe
Holden Clough Nurseries
Bolton-by-Bowland
Lancashire
BB7 4PF

Date

2022-05-13

Valid until

2023-05-13 (1 year after date of issue)

Report Status

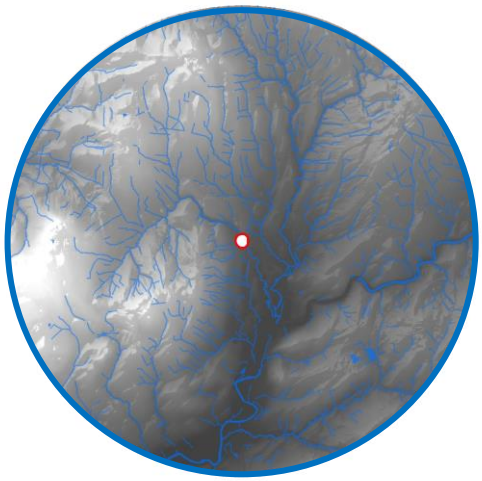
FINAL

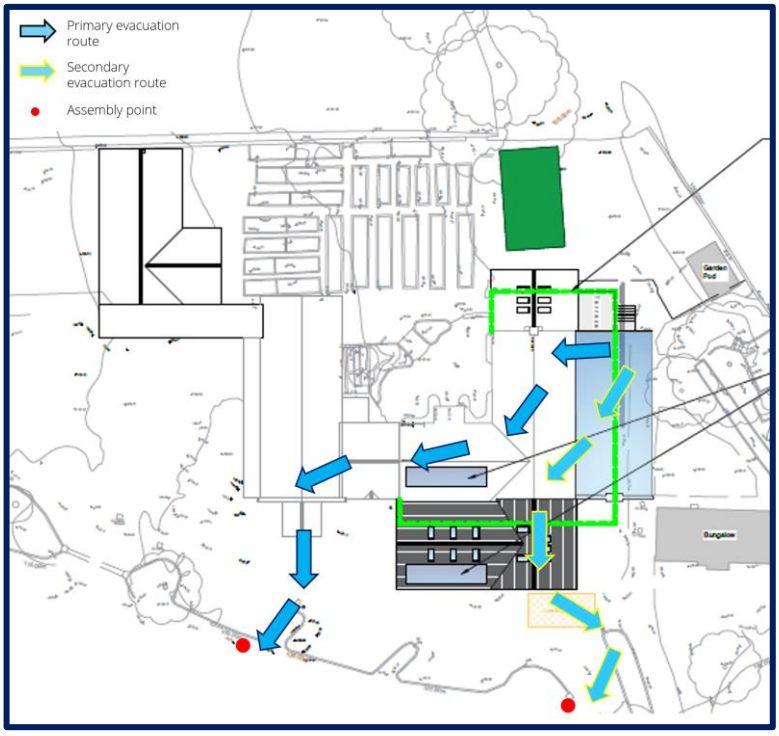
Site Area

0.1443ha

Report Reference

76707.01R1





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1. Flood Warning & Evacuation Procedure

This report has been compiled for use by the Site management team and users of the buildings.

- This report should be provided to users of the Site in an information pack.
- All Site occupants and users should be made aware of flood alarm systems.

Site Owner Procedure

Warning Systems and Regular Checks

1. Sign up to the Environment Agency's Flood Warning Direct (FWD) service;
2. Ensure flood alarm systems are installed and operational;
3. Test flood alarm systems;
4. Run bi-annual flood alarm drills to test alarm systems and occupants responsiveness to alarms;
5. Make sure any flood barrier systems are easily available from storage and are in good condition;
6. Make sure first aid kits are available and that the Flood evacuation street map is clearly displayed in the buildings;
7. Maps should be printed and laminated to provide to occupants in the event that evacuation is required;
8. Update this report with any changes to flood alert and warnings and any changes to the procedures.

Flood mitigation and evacuation procedures

9. On receipt of a flood alert, begin extracting any flood barriers from storage;
10. Undertake flooding observations every 2-3 hours at the Site and surrounding area;
11. Take a log of observations and any localised flooding or issues arising at the Site;
12. Once the site flood alarm sounds, contact the Emergency Services to obtain confirmation on whether occupants should evacuate the Site;

STOP AND TAKE 5 TO THINK

13. On instruction from the emergency services, manually sound the flood alarm;
14. Ensure all users and occupants of the Site are directed to the assembly points at the entrance and exit routes to the Site;
15. Site owner to provide printed maps of the evacuation route;
16. Site owner to guide occupants along the safest route to evacuate from the Site;
17. A designated Site team member to knock on doors within the building to make sure occupants have evacuated;

18. Where persons do not evacuate, log their name, address and telephone number.
19. A designated Site team member to install flood barrier systems at entrances;
20. A designated Site team member to raise valuable items from floor level to a higher elevation;
21. Lock up key zones to protect valuable items, but ensure doors are kept unlocked to allow any occupants remaining within the building to leave the Site.

Users of the Site and other Occupants Procedure

If you are a user of the Site, you should make sure the key points are followed to ensure safety in the event that a flood occurs and begins to affect the Site.

The probability of an event which floods the Site is Very Low-High; if a flood does occur, it is imperative that evacuation procedures below are followed. They have been put together to keep you safe and to ensure you have sufficient warning to move valuable items such as vehicles to higher levels and to evacuate from the Site.

When the river levels are at their highest, flooding could affect the north eastern area of the Site.

If you follow these procedures though and evacuate early, you will not need to cross flood waters of significant depths and the Site owner can guide you safely to an area outside of the floodplain where alternative arrangements for transport and accommodation can be made.

Warning Systems and Regular Checks

1. Sign up to the Environment Agency's Flood Warning Direct (FWD) service;
2. Partake in any bi-annual flood alarm drills which the Site owner runs;
3. Make sure you have a first aid kit, torch and clean drinking water in your buildings.

Flood mitigation measures

4. On receipt of a flood alert, begin considering moving any parked vehicles to a higher level;
5. Read through the Flood Warning and Evacuation Plan and make sure you know the route away from the Site.

STOP AND TAKE 5 TO THINK

6. On receipt of a flood alert, the Site owner will be monitoring the situation and will communicate the next steps to you;
7. Once you hear the Site's flood alarm, please make sure you collect your coat, keys, wallet, wellington boots or similar, and any medication;
8. Make your way to the assembly point shown in the map overleaf;
9. Ensure all occupants of your building travel with you and you advise the Site owner of anybody left behind;
10. Once at the assembly point, the Site owner will provide printed maps of the evacuation route to you;

11. The Site owner will guide you along the safest route to evacuate from the Site to the safest area possible;
12. Avoid all manholes or areas of low ground along the route, and keep to the highest ground level to get to an area away from the flooding;
13. Alternative travel and accommodation arrangements should be made from here.

2. Introduction

This Flood Warning and Evacuation Plan (FWEP) has been produced by GeoSmart Information Limited, on behalf of John Metcalfe for Holden Clough Nurseries, Bolton by Bowland, Lancashire BB7 4PF (the Site).

The FWEP has been produced using guidance and flood data obtained from Environment Agency (EA) datasets. A Flood Risk Assessment (FRA) has been produced separately (GeoSmart ref: 76707R1) and information contained within the FRA report has been used to inform this FWEP.

Flood waters can create a wide range of hazards that can result in damage to property, injury and in extreme cases the loss of life. The behavior of flood water is a large contributing factor to the hazards it can present, and the risks of death are likely to be greatest where one or more of the following conditions exist:

- High flow velocities;
- Rapid onset of flooding;
- Deep flood water;
- Failure of defensive infrastructure;
- Debris and pollutants within flood waters; and
- Where extensive low lying densely populated areas are affected.

Advice provided by the EA, confirms that six inches of fast-flowing water can knock over an adult and two feet of water can move a car (DEFRA/Environment Agency, 2006). This illustrates how flood water depths, even those that are regarded as shallow, can still be extremely dangerous to people.

Flood water has a high probability of being contaminated from various sources during an event and can therefore be dangerous to human health. Flood water should never be used as a source of drinking water and hands should be washed thoroughly if they come into contact with flood water.

Scope

The scope of this FWEP is to provide practical advice for handling and mitigating the risk of flooding on-Site, highlighting aspects that should be considered when occupying during a flood, confirmation of the most appropriate escape routes and re-occupying the Site once flooding has receded.

The FWEP will detail Flood Warnings and the procedures that should be followed in the event of an evacuation event, including how occupants and users of the Site obtain timely warnings for safe evacuation and refuge in the event of a flood event. The plan identifies the measures available to inform and alert users of the Site and owners.

Objective

The objective of this FWEP is to demonstrate the risks posed by flooding to the Site and to provide site specific information on the likelihood of flooding and potential evacuation routes. The plan raises awareness of risk to the Site and informs management staff and users of the Site on the safest way to evacuate, including applicable routes to take in the event of a flood. It also confirms when safe refuge (invacuation) should be sought.

Ownership

The ownership of this plan is key to ensuring it is maintained for the lifespan of the development and most importantly to ensure its successful use during practice drills or a proper event.

Contact names for the Site Owner who will take ownership for the FWEP at the Site:	
Contact names of those responsible for evacuation of the Site:	
Contact names of those responsible for making sure the Site is safe & operational after a flood:	

Distribution

The distribution of this FWEP should be made to Site Owners and users of the Site, but also distributed to those areas where a copy of the FWEP should be stored, if required in the event of a flood.

Distributed to (name/area)	Date of distribution				

* Please add a (✓/X) to confirm distribution to all parties and the date of distribution.

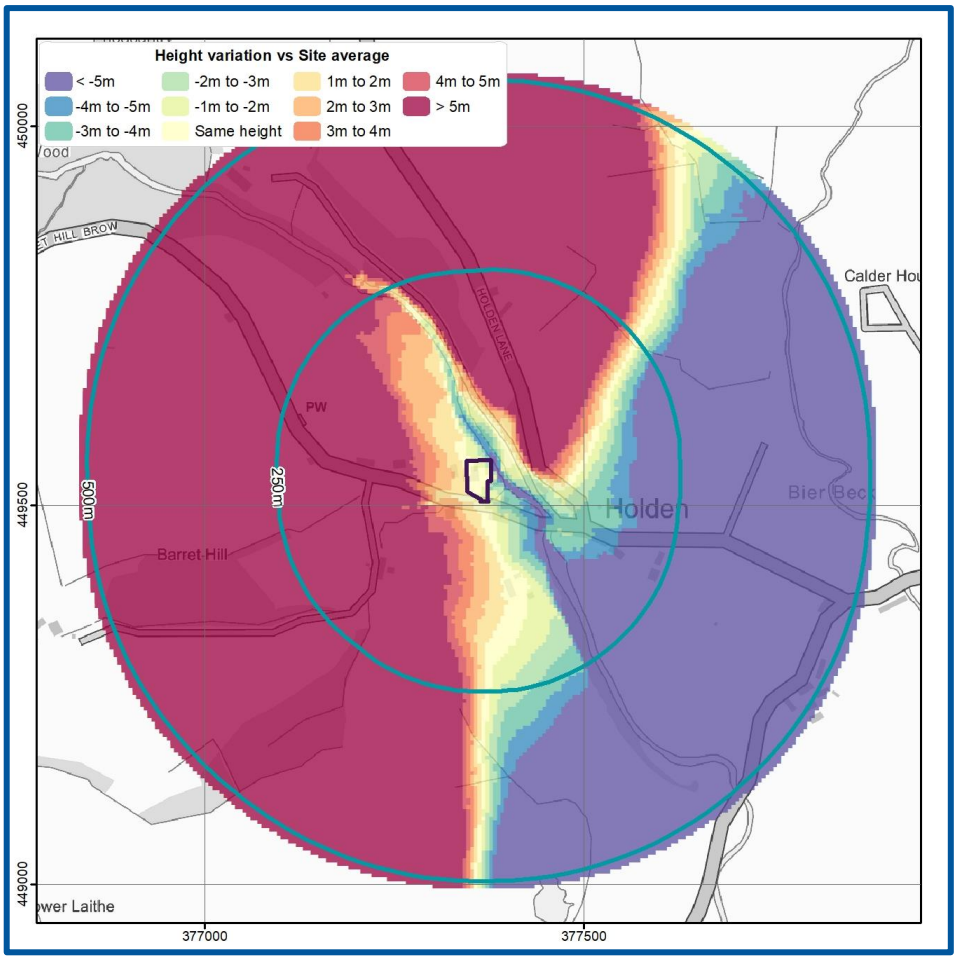
3. Site conditions

Site information

The Site is located in Bolton-by-Bowland in a setting of commercial and residential land use at National Grid Reference SD 77384 49484. Site plans and drawings are provided in Appendix A.

According to OS data, using a 500 m buffer around the Site, the area is on a steep slope (Figure 1). It is noted that to the north land rises to c. 133.7 m above Ordnance Datum (AOD). To the west land rises to c. 165.0 mAOD, to the east land falls to c. 94.4 mAOD and to the south falls to c. 96.9 mAOD.

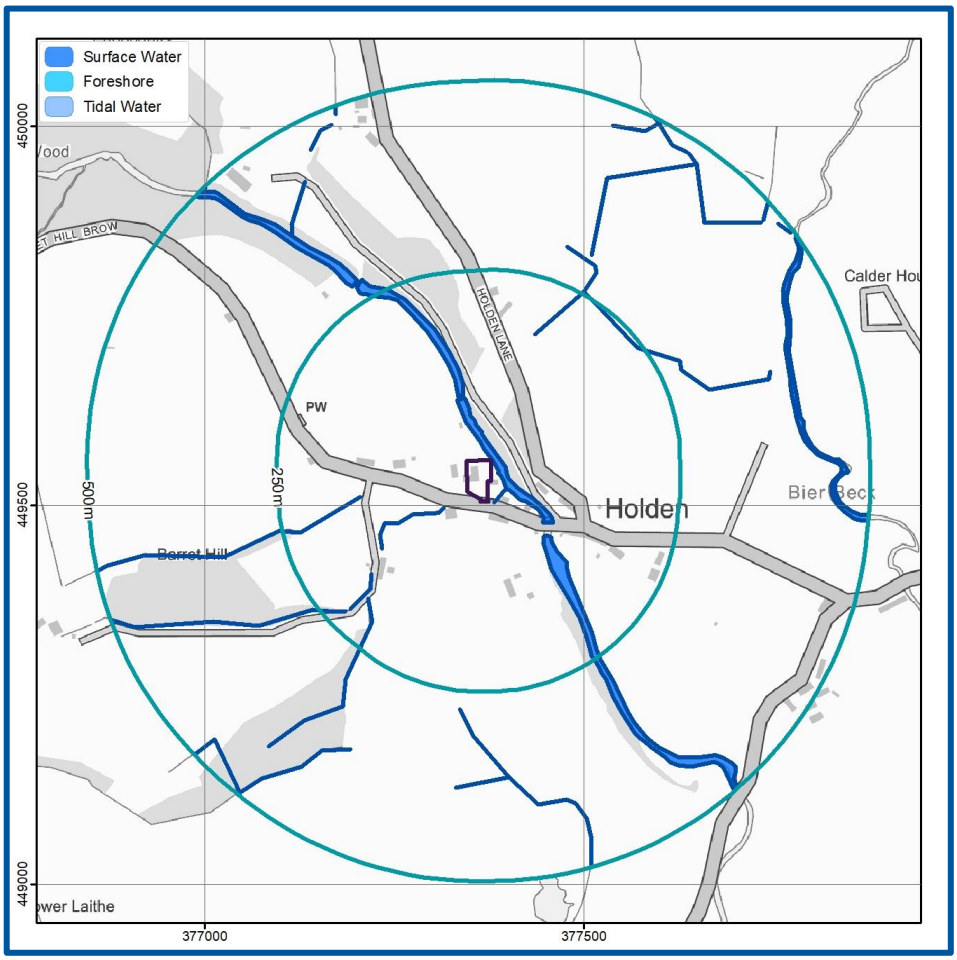
Figure 1. Site Location and Relative Elevations (GeoSmart, 2022)



Hydrological features

There are numerous surface water features within 500 m of the Site (Figure 2).

Figure 2. Surface water features (EA, 2022)



The Mear Gill River is located immediately adjacent to the north east of the Site at a lower elevation. The Scarloom waterfall has been identified, on the river, approximately 90m to the south east of the Site. The Bier Beck River is located approximately 450 m to the east of the Site at a lower elevation.

Multiple drainage ditches are located to the north east of the Site, with the closest approximately 180m away at a higher elevation than the Site.

Multiple drainage ditches are located to the south and south west of the Site, with the closest approximately 40m away at a higher elevation that the Site.

Flood risks

A Flood Risk Assessment (FRA) was produced for the Site in April 2022 by GeoSmart Information Ltd. (ref: 76707R1) to support the extension of the existing building to create additional storage space, a kitchen, café dining area, retail space and an exterior terrace with storage below, classed as Less Vulnerable.

- According to the Environment Agency's (EA) Flood Map for Planning Purposes, the Site is partially located in a fluvial Flood Zone 3 (High probability).
- According to the EA's Risk of Flooding from Rivers and Sea (RoFRS) map, which considers the type, condition and crest height of flood defences, the Site has a Very Low-High risk of flooding from Rivers and the Sea.
    - Areas at High risk of flooding are located in the north east of the Site
    - A further area in the north east of the Site is at Medium risk of flooding
    - The rest of the Site is at Very Low risk of flooding
- In the absence of modelled flood data from the EA, a comparison of the EA's 1m LiDAR data and the EA's flood zones has been undertaken. The 1m LiDAR data has been classified and the highest elevation on the extent of the Flood Zone 3 and 2 has been used to form the basis for the 1 in 100 year and 1 in 1000 year flood events respectively.
    - During a 1 in 100 year plus 36% climate change allowance fluvial event the flood level at the Site is 106.0 mAOD.

      During this event, flood depths in the area proposed for development could be up to 0.4 m.
- According to the EA's Risk of Flooding from Surface Water (pluvial) flood mapping, there is a variable risk of pluvial flooding at the Site ranging from Very Low-High.
- GeoSmart's Groundwater Flood Risk (GW5) mapping confirms there is a Negligible risk of groundwater flooding at the Site during the 1 in 100 year event (1% annual probability).
- Further analysis has upgraded the risk of groundwater flooding to a variable range between Negligible-Moderate due to the groundwater below the Site is likely be in continuity with the fluvial system, due to the presence of permeable superficial deposits. Consequently, a variable groundwater flood risk exists on Site.
    - In the north east of the Site, within the extent of the 1 in 100 year surface water flood extent the risk is Moderate
    - In the north east of the Site, within the 1 in 1000 year surface water flood extent the risk is Low
    - The rest of the Site is at a Negligible risk of groundwater flooding.
- The risk of flooding from artificial (man-made) sources such as reservoirs, sewers and canals have been assessed:
    - The EA's Risk of Flooding from Reservoir map confirms the Site is not at risk of reservoir flooding.

- According to Ordnance Survey (OS) data, there are no canals within 500 m of the Site.
- A sewer flooding history search was undertaken using the Strategic Flood Risk Assessment (Ribble Valley Borough Council, 2010). This does not identify any incidences of sewer flooding at the Site

- A primary evacuation route from the north eastern extension through the main building and immediately west on Holden Lane to a grassed area adjacent to the Site's exit is proposed, travelling approximately 5m west. The route is allocated as Very Low hazard.
- A secondary evacuation route is possible from the northern extension through the main building and east on Holden Lane to a grassed area adjacent to the Site's entrance. This route is approximately 5m to the east of the Site and allocated as Very low hazard.

Figure 3. Risk of Flooding from Rivers and the Sea map (EA, 2022)

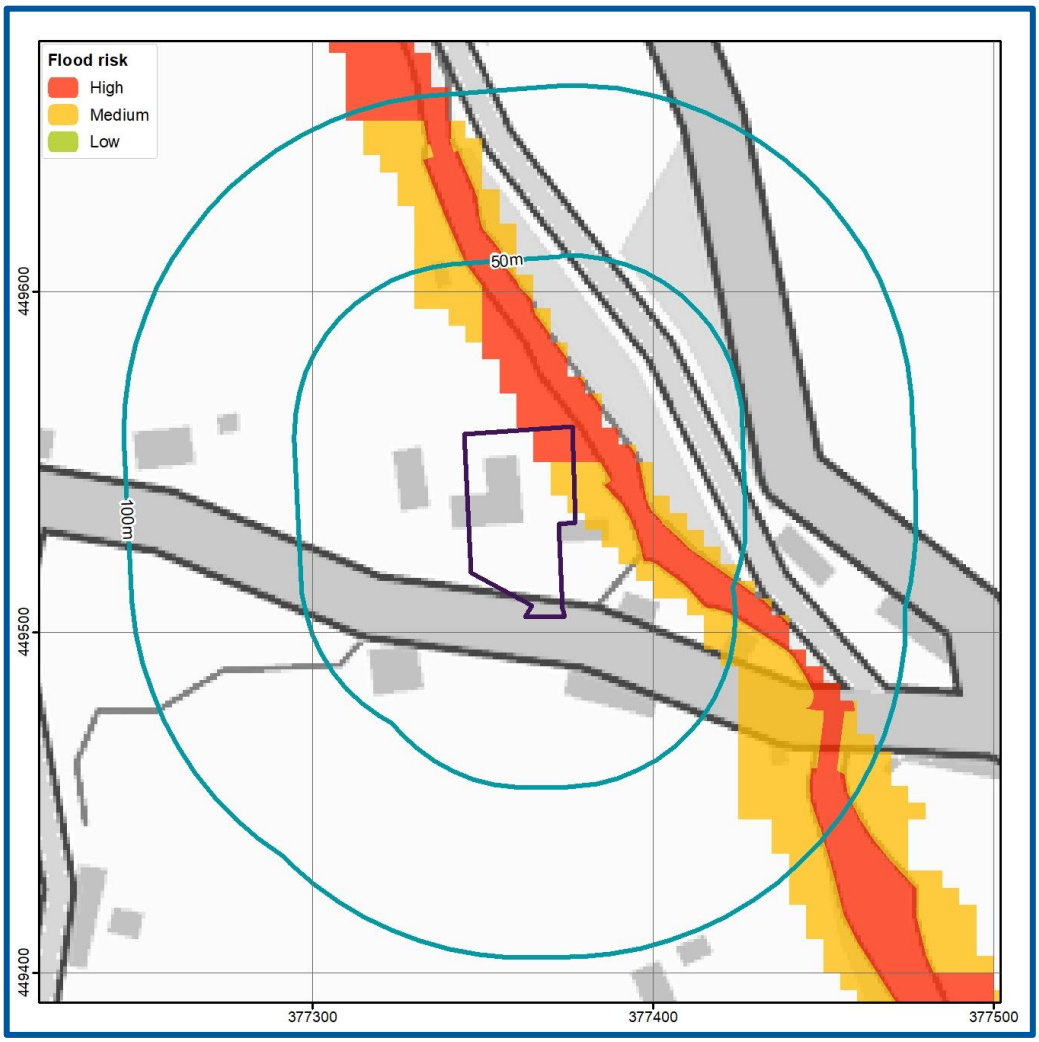


Figure 4. EA Medium surface water flood risk map (EA, 2022)

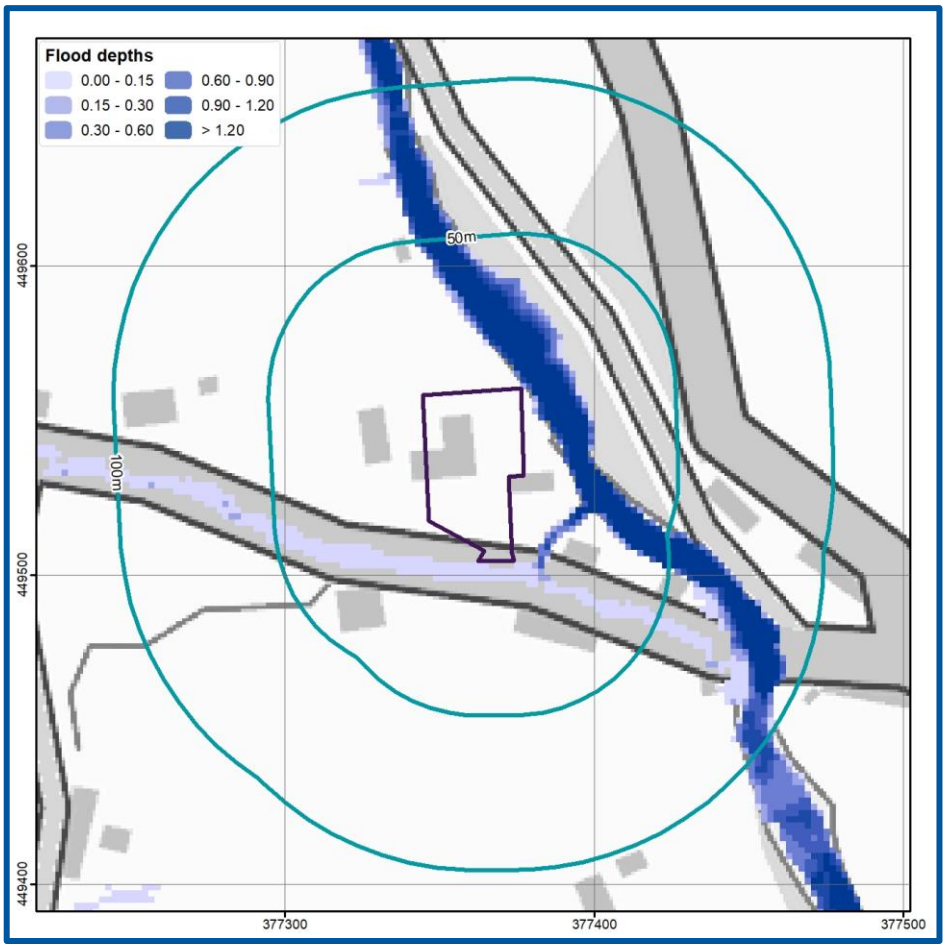


Figure 5. GeoSmart GW5 Groundwater Flood Risk Map (GeoSmart, 2022)

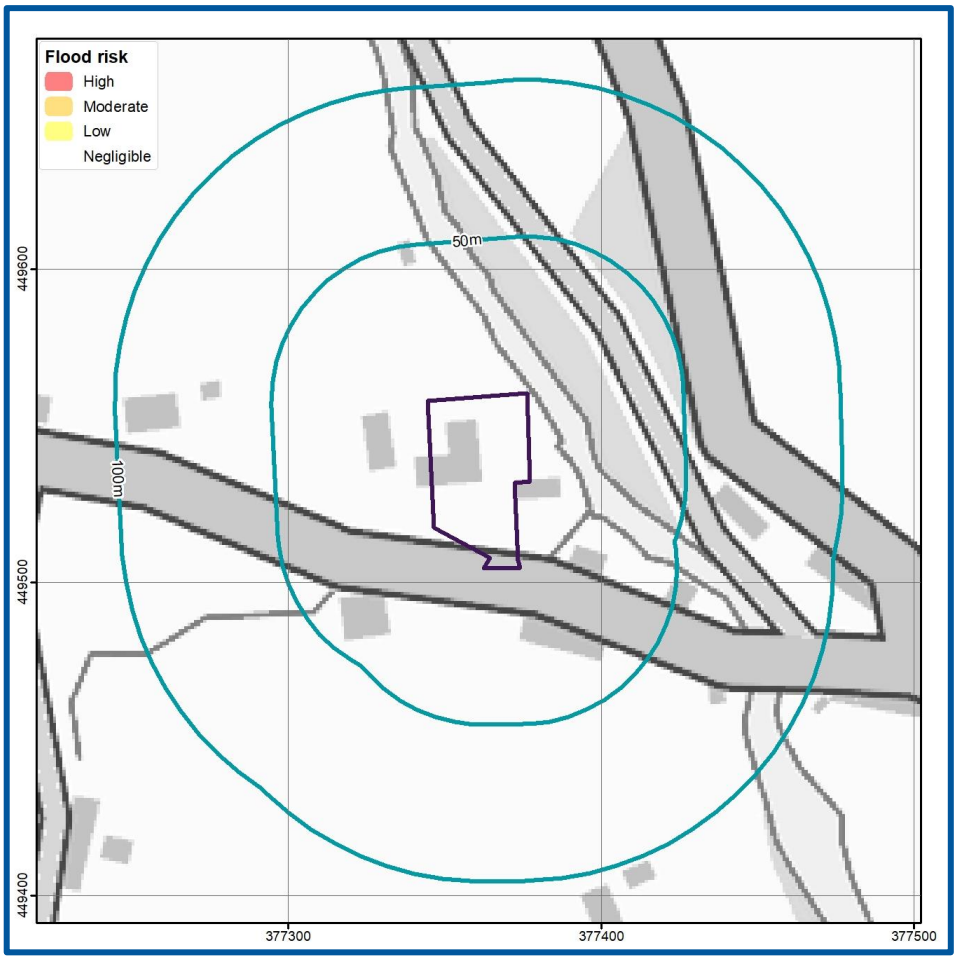
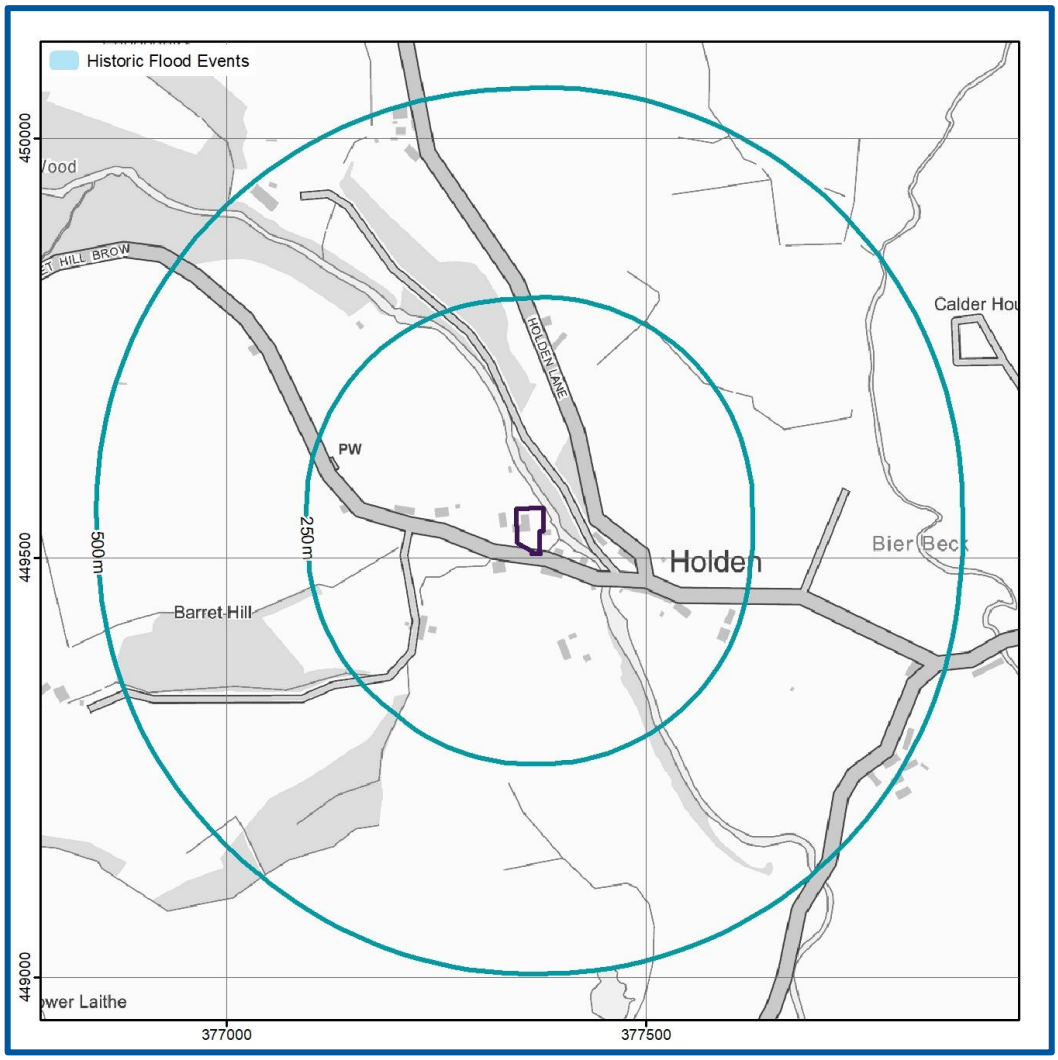


Figure 6. EA historic flood map (EA, 2022)



4. General flood warning information

Environment Agency flood information service

The EA are the main authority for providing a flood warning service in England. They operate a flood forecasting and warning service for areas which are classed as being at risk from fluvial, coastal or groundwater flooding. The EA flood warning services run 24 hours a day, 7 days a week all year round.

Environment Agency flood warning levels

- A **Flood alert (Prepare)** is issued when river levels rise to a point where there would be flooding of low-lying floodplain areas and roads. A groundwater flood alert is issued when observed groundwater levels reach a critical point.
- A **Flood warning (Act)** is issued when river levels rise to a point where the first property is likely to flood. The EA normally set a trigger level to the nearest gauge and the first property to flood in a flood warning area.
- A **Severe flood warning (Survive)** is issued when there is likely to be danger to life.

The EA's flood information service allows people to monitor river levels and the associated flood warning level. This link will also provide site specific flood risk, the 5 day flood risk forecast and the national flood situation:

https://flood-warning-information.service.gov.uk/warnings

When an area is identified as being at imminent risk of flooding, warnings are issued using one of three levels:

1. **Flood alert**: Prepare
    a. Begin minor flood preparation activities that do not affect the running of the home/business.
    b. Prepare a bag that includes medicines and documents.
    c. Check flood warnings.
2. **Flood warning**: Act
    a. Turn off gas, water and electricity.
    b. Move items at risk of damage upstairs or to safety.
    c. Evacuate all site users, pets and vehicles. If required staff members should complete all flood preparations providing that the warning indicates that there is sufficient time to do so. Then proceed to evacuate the Site.
3. **Severe flood warning**: Survive
    a. A dangerous flood is imminent. All personnel should be evacuated immediately.
    b. Call 999 if in immediate danger.
    c. Follow advice from emergency services and keep safe.

It should be noted that a severe Flood Warning can be issued without a Flood Alert or Flood Warning notice. This is more common in flood defence breach or during intense thunderstorms, when flash flooding could occur.

If there is an emergency that threatens life the first point of contact should always be 999.

Figure 7. Flood Alert, Flood Warning and Severe Flood Warning (EA, 2022)

Flood Alert Category	What it Means	When it is Used	Action
 Flood Alert	Flooding is possible, be prepared	Two hours to two days in advance of flooding	• Be prepared to act on the flood plan. • Monitor local water levels and the EA flood forecast.
 Flood Warning	Flooding is expected, immediate action required	Half an hour to one day in advance of flooding	• Move pupils, staff and valuables to a safe place. The Site should then be evacuated to the nearest evacuation shelter at a location to be advised by the Local Emergency Planning Officer or Environment Agency via the EA Floodline or local radio and television broadcasts. • Turn off gas, electricity and water supplies if safe to do so. • Put flood protection equipment in place.
 Severe Flood Warning	Severe flooding, danger to life	When flooding poses significant threat to life	• Stay in a safe place with means of escape. • Pupils and staff should take refuge on the upper floors of the school buildings. • Remain in contact with the emergency services, cooperating with any instructions issued by the police or other emergency service. • Occupants should not turn services, such as gas supply, back on again until the service provider confirms it is safe to do so.
Warnings No Longer in Force	No further flooding expected in your area	When river conditions begin to return to normal	• Be careful, flood water may still be around for several days. • The Site may be reoccupied once deemed safe to do so by the emergency services.

Flood warning service

Signing up to receive warnings in England is a free service that is run directly by the EA providing warnings directly to homeowners, businesses and other facilities via telephone calls, text and e-mail.

In England, warnings for more than one Site can be received (i.e. if a business has several sites), however this targeted flood warning service is not a free service unless it is a not-for-profit organisation.

Registration to the Environment Agency's flood warning scheme can be undertaken by following this link:

https://www.fws.environment-agency.gov.uk/app/olr/register

Estimated flood warning time

The estimated lead time between flood warnings being sent to individuals and the time of flooding is important. Relatively accurate estimation times are available (based upon forecasted rainfall and current tidal levels) during a flood event and will have a bearing on which evacuation plan is most applicable to the situation at hand.

For fluvial flood events, the EA try to give a 2 hour time frame between a flood warning and an actual flood event. However, the estimated flood warning time will depend on Site location and flow speed so warnings may not be given within this time.

If the Site is not covered by the EA flood warning service or a flood forecast is required, live flood warning information can be obtained by following this link:

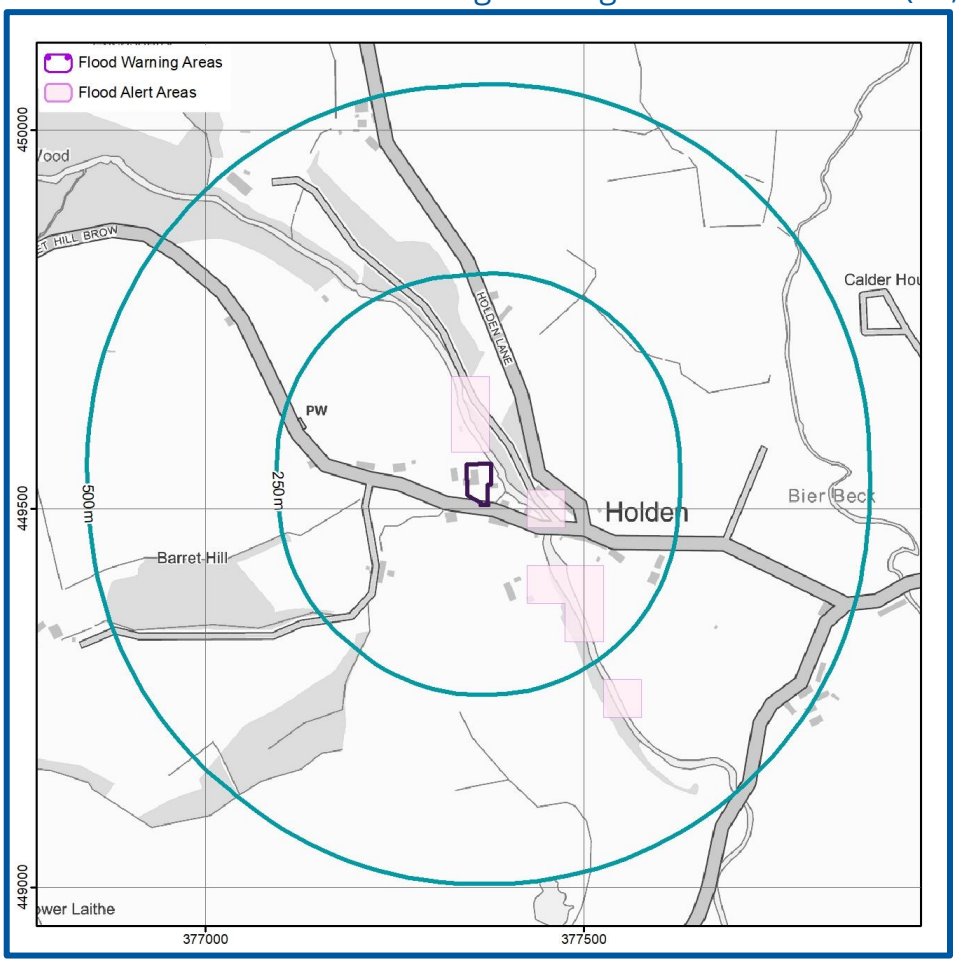
https://flood-warning-information.service.gov.uk/warnings

Landlords/owners and tenants should sign up to the EA flood warning service.

Site specific flood warning information

The Site is not located within an EA Flood Alert Coverage area so is unable to receive tailored flood alerts (Figure 8). However, all warnings are available through the EA's 24-hour Floodline Service: 0345 988 1188. The Site Owner should register with Floodline, if possible, to receive flood alerts by calling: 0345 988 1188.

Figure 8. EA flood alert and warning coverage for the local area (EA, 2022)



A Flood Alert should be used to trigger the monitoring and reporting of the status of the flood to the Site Owner. The EA aims to issue flood warnings 2 hours in advance of a flood event.

Up to date information about potential flooding can also be received by:

- Calling Floodline on **0345 988 1188**.
- Visiting the EA website: **www.environment-agency.gov.uk/flood** for flood risk forecasts, live flood warnings and alerts.
- Listening to local radio and TV for weather information.
- Free flood alert smartphone application developed by Halcrow which allows quick and convenient access to EA's live flood warning feeds.

If a flood alert is received and flooding is occurring on the Site or within the surrounding area. The Site Owner will call Floodline to receive information on the nature of the flood alert and consult with the regular authorities on their advice as to whether an evacuation is recommended. This should be reported back to the users of the Site, along with any other occupants at the time.

5. Flood evacuation preparation

Security procedures, policies and regulations

Regulations, codes and policies applicable to the Site in the event of a flood should be considered, to ensure Occupational Health and Safety Regulations are adhered to.

Important polices to consider for the business include:

- Insurance policies – Insurance for flood damage, business interruption and lost revenue.
- Hazardous materials plan – To ensure that chemicals, oils and other substances are kept safe and do not contaminate flood water.
- Health and safety assessment – Plan to check the functioning of flood products and flood warning systems regularly.

Identify products and services not required in the event of a flood, or which suppliers may not be able to provide. Consider contracting in advance with companies whose help you may need after a flood.

Distribution of Flood Warning and Evacuation Plan

The Site Owner will ensure users visiting or who are new to the Site are briefed on the risks and FWEP procedures. The FWEP should be reviewed after the first year and then by the Site Owner every three years or more regularly where a flood event has occurred and affected the Site.

Plans and key documents should be reviewed, contact details changed depending on change of organisation, management, flood risk or warning procedures.

Distribution to users of the Site: The FWEP and relevant documents will be available in each building on Site. Evacuation routes should be clearly visible around the Site and in the different buildings.

Health and Safety records should be stored and note taken of which team members have been trained and informed of FWEP procedure. The FWEP and key documents should be reviewed every three years and contact details changed depending on change of team members, managers, and flood risk or warning procedures.

Flood kits

A **flood kit(s)** should be prepared and kept in each building on the Site containing essential items and provisions required to keep site users safe during a flood event. Items that should be included in a flood kit are listed in Appendix A: Flood Kit Check List.

Team members/users of the Site details

A list of team member contact details should be stored and easily accessible in the event of an evacuation. This may also include mobile telephone numbers, or numbers for them or the home of a friend or relative.

Think about users of the Site who may need special assistance in the event of a flood (for example, elderly, deaf, blind etc.).

Tables and checklists

A list of relevant tables that should be completed by the Site Owner and utilised by all Site users as part of the Flood Warning and Evacuation Plan, are included in Appendix B. This will allow for quick identification of lead points of contact in an evacuation procedure, all tenants and contact details, individuals who may require assistance and location of key documents for the development. It also allows for quick identification of flood kits and first aid kits if the situation arises.

Flood protection

In accordance with the FRA produced for the development (ref: 76707R1) flood mitigation measures which are likely to be included as part of the design plans to help prevent the ingress of water into any buildings or key areas, thus reducing the potential damage costs after a flood event include:

- As there is a risk of flooding from fluvial sources, Finished Floor Levels (FFL) of the development should be set to the proposed design level of 107.79mAOD.
- Standard water entry, flood resistance and resilience design measures should be incorporated.
- As there is a risk of flooding from surface water (pluvial) sources, ground levels should aim to slope away from buildings and designed to channel any overland flows off-site (to the south) away from the development towards site drainage systems.
- It is recommended that main communication lines required for contacting the emergency services, and first aid stations are not compromised by flood waters. Where possible these should all be raised above the extreme flood level.
- A Sustainable Drainage Strategy (SuDS) should be developed for the Site, for effective management of surface water runoff from the proposed development.
- Preparation before a flood event is crucial in minimising the risk to people during times of flood. It is recommended all electrical equipment and paper records are stored in raised locations and backed up to an offsite location where possible.

The above mitigation measures should not be thought of as mitigating against all flood events at the expense of people's safety. Once an order to evacuate is given it should be followed immediately.

Evacuation procedure

Flood Alert procedure

Whilst the Site is not located within a Flood Alert/warning coverage area, by registering with Floodline the Site is able to receive Flood Alerts/Warnings for the surrounding area. Once a Flood Alert has been received for the Site, it must be communicated to users of the Site. It is imperative that once a Flood Alert has been issued, that it is received and communicated to all persons at risk. Potential approaches could include:

- An alarm system with a ring different to that of the fire alarm system.

- A system where all users of the Site are able to receive instant communication messages from the Site Owner or those who are responsible for the FEP via text message or e-mail.

It is also recommended, where possible, the users of the Site also sign up to the Flood Warning direct service so that they can also receive flood alerts via text, e-mail and by phone call.

The FWEP should be maintained by the key contacts and updated accordingly. It is recommended that the Site Owner takes ownership of this document.

Safe Refuge (Invacuation)

Safe Refuge (Invacuation) is available above the flood level. If on-Site refuge is chosen as the preferred decision, the emergency services should be contacted immediately.

Users of the Site seeking Site refuge within the development should not attempt to use switchgear if the Site is within flood water. Users of the Site should be equipped with waders / wellington boots and alternative lighting such as a torch and warm clothing as utilities such as power and heating will likely be off for the duration of the event. These measures should be included in emergency packs or flood kits.

Priority should be given to an evacuation of the Site and the refuge point should only be used when it is unsafe to evacuate.

If it has not been possible to evacuate the Site during a flood event the emergency services must be contacted so a rescue can be initiated at the earliest possible moment.

It is recommended that users do not attempt to evacuate if flooding of the Site or surrounding area is already occurring. If any Site users cannot or will not evacuate, the emergency services are to be informed immediately. An area of safe refuge for all Site users and occupants should be available within the dwelling until such time that flood waters subside.

The Emergency Services will become the lead agencies in respect to the flood incident. The Emergency Services will lead on the decision to evacuate and any subsequent evacuation of the development. The site management will be responsible for making contact with all Site users as required during an evacuation event.

The FWEP should be maintained by the key contacts in the following table and updated accordingly. It is recommended that the Owner takes ownership of this document.

Emergency Evacuation

Where possible, a safe access and egress route with a 'Low' hazard rating from areas within the floodplain to an area wholly outside the fluvial 1 in 100 year flood event, outside of the Site boundary including an allowance for climate change should be accessible.

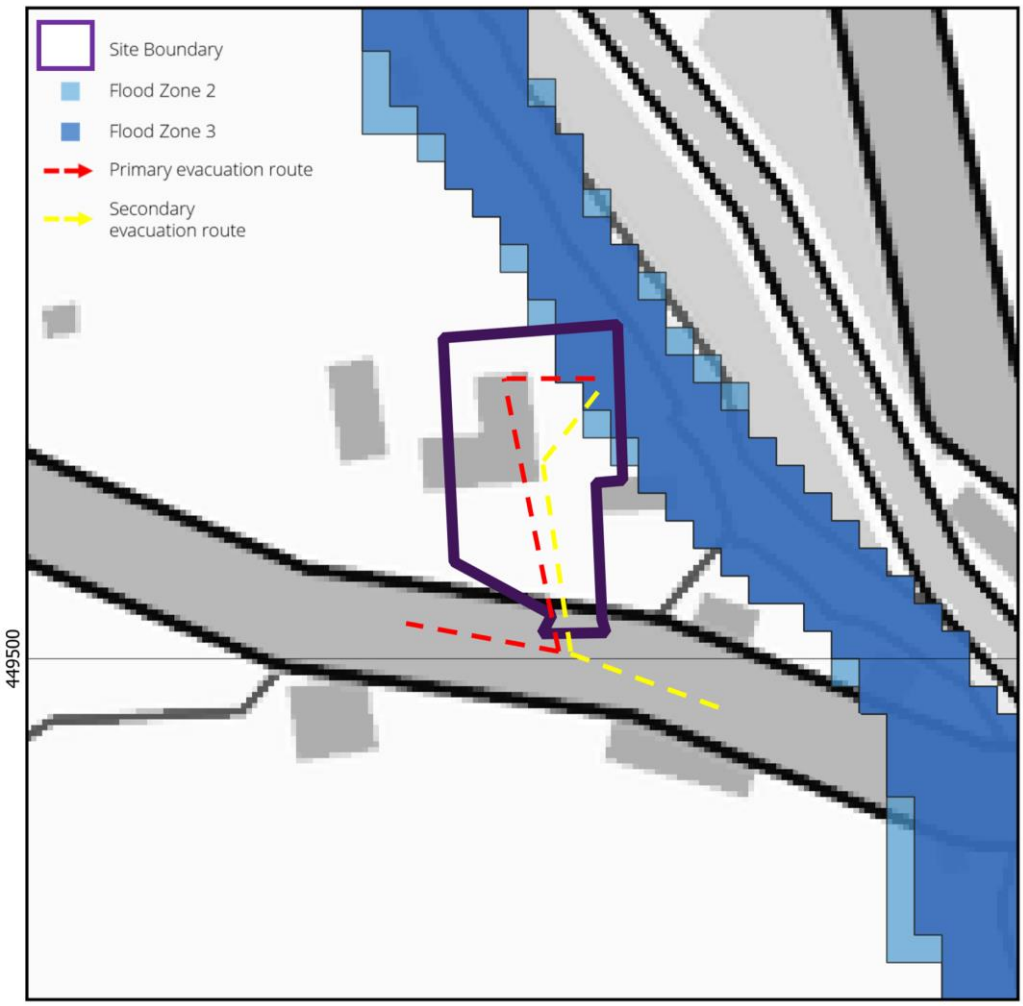
Evacuation routes travel off-Site in the case that flooding causes issues with the operation of the Site, including water supply and electrical issues.

A flood alert from Floodline (after registration) would be required to trigger an evacuation with a 'very low' hazard rating from the development.

Based on the EA Flood Risk Map two potential emergency evacuation routes exist:

- A primary evacuation route from the north eastern extension through the main building and immediately west on Holden Lane to a grassed area adjacent to the Site's exit is proposed, travelling approximately 5m west. The route is allocated as Very Low hazard.
- A secondary evacuation route is possible from the northern extension through the main building and east on Holden Lane to a grassed area adjacent to the Site's entrance. This route is approximately 5m to the east of the Site and allocated as Very Low hazard.

Figure 9. Evacuation route away from the Site and fluvial Flood Zones



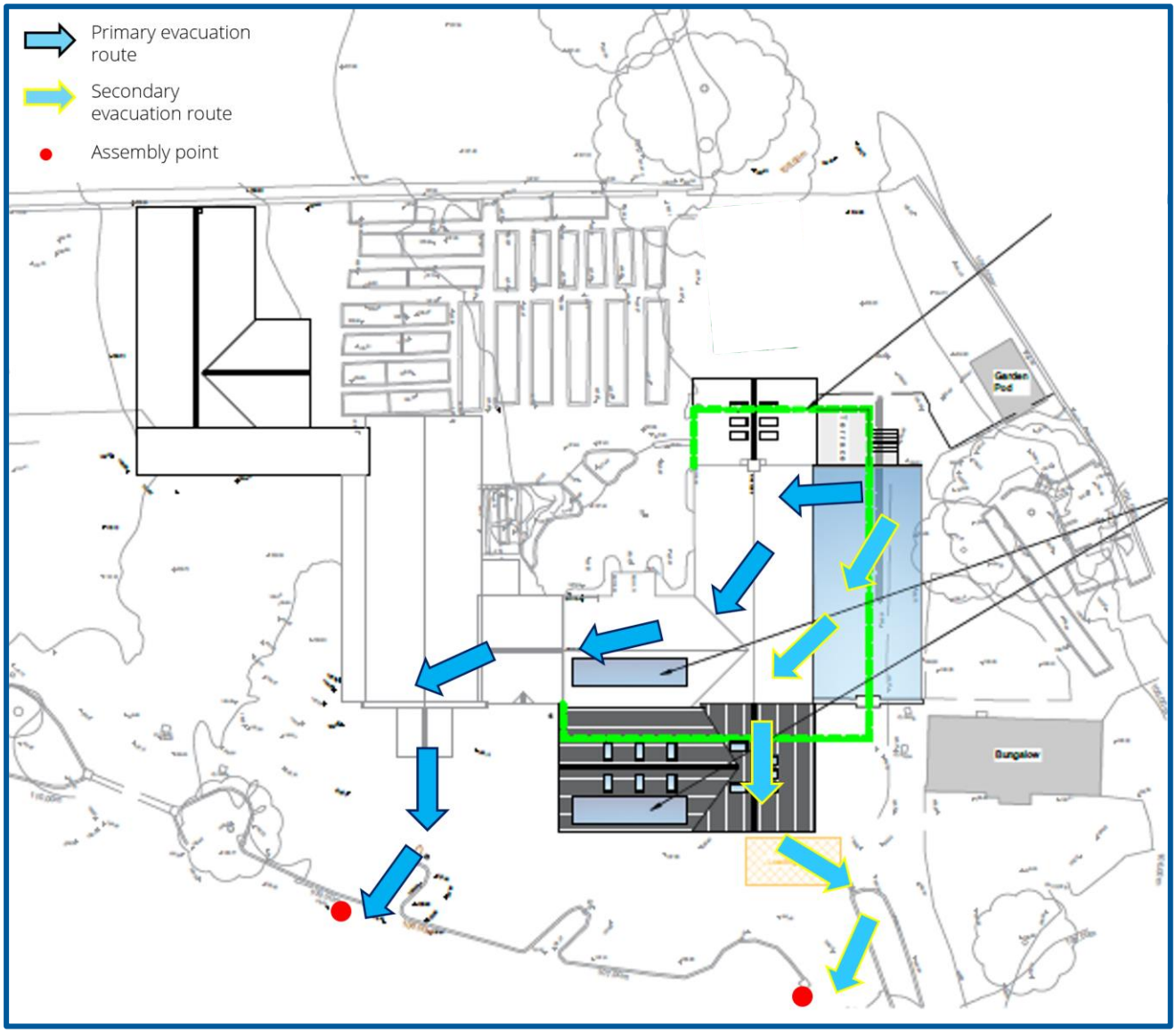
Key contact information

Contact names for the Site Owner and who will take ownership for the FWEP at the Site:	
Contact names of those responsible for evacuation of the Site:	
Contact names of those responsible for making sure the Site is safe & operational after a flood:	

The effective communication of the issued flood alert will rely heavily on the Site Owner to register with Floodline. Once the Flood Alert has been received by the relevant party, the owner, has a duty of care to protect, inform and guide all Site users to either remaining within the building and seeking safe refuge or taking the appropriate evacuation route.

GeoSmart Information

Site evacuation route



Plans taken from Holden Lancashire Limited 2020

Re-occupation of the Site

Once the FWEP has been implemented, people must not be able to enter the Site who are potentially unaware of the impending flood event. Efforts must be made to notify members of the public that the Site should not be accessed. During a flood, the Site access and surrounding area are likely to be inundated with flooding. Access to the Site may be closed off by the emergency services.

Preparing for the possibility of flooding long before a flood event can greatly reduce lost time and costs including insurance after a flood. Storing equipment and sensitive documents above the ground floor level will ensure records are not lost and there will be no need to replace potentially expensive items. An area on-Site should be designated to store flood protection equipment and nominated responsible persons should be trained in its use.

The Site owner must identify products and services required in the event of a flood. When confirmation is received from the EA, Local Authorities and insurance companies that the Site is safe for re-occupation, the Site Owner is responsible for ensuring the entry to the Site, buildings and surrounding area is safe. They will assess the primary entry to the building for safe passage and assess utilities to determine if they are in a safe condition to be switched on.

When re-occupying a building, it is important to remember that there may be environmental hazards, structural damage and other dangers to human health. These may need to be resolved before people are able to safely re-enter the Site. Care should be taken when entering the Site as manhole covers may have been removed and sharp objects and debris could have been left behind by the flood. Pollution may also be present on Site so personal protective equipment (PPE) (such as waterproofs, gloves, wellington boots and face masks) should be used by those re-entering the Site. A clean-up operation should then be organised by the Site Owner in accordance with any related requirements / agreement from the insurance company.

Once the insurance details have been agreed and the building and electrical services have been cleared by a suitably qualified person, a timeline should be constructed to estimate the timeframe to re-occupation.

7. Report Background

Report limitations

It is noted the findings presented in this report are based on a desk study of information supplied by third parties. Whilst we assume that all information is representative of past and present conditions, we can offer no guarantee as to its validity and a proportionate programme of site investigations would be required to fully verify these findings. This report excludes consideration of potential hazards arising from any activities at the Site other than normal use and occupancy for the intended land uses. Hazards associated with any other activities have not been assessed and must be subject to a specific risk assessment by the parties responsible for those activities.

Datasets

The following table shows the sources of information that have been consulted as part of this report, included within the Flood Risk Assessment (GeoSmart FloodSmart Plus Report Ref: 76707R1):

Source of flooding	Datasets consulted				
	Commercial Flood Maps and GW5 Data	SFRA	Environment Agency	Flood Risk Assessment (GeoSmart, 2022)	OS Data
Historical	X	X	X	X	
Fluvial/tidal	X	X	X	X	
Surface water (pluvial)	X	X	X	X	
Groundwater	X	X		X	
Sewer		X		X	
Culvert/bridges		X		X	X
Reservoir		X	X	X	

8. Conclusions and Recommendations

The Site is partially located within fluvial Flood Zone 3. There is a High RoFRS risk in the north east of the site. The Site is located in an area of variable Low to High pluvial flood risk and a Negligible groundwater flood risk.

The flood risks from all sources have been considered within this FWEP, using the EA's most up to date flooding data and commercially available datasets.

FRA Mitigation. The FRA (ref:76707R1) has recommended the raising of finished floor levels on-Site; however, evacuation should be considered as the primary preference in the event of a flood.

A specialist flood alarm system is to be installed at the south entrance of the main building on Site, within manhole and ACO drain arrangement or fitted to the wall at the preferred level. The water / flood monitoring device is to be linked to flood alarm system, sounding within all buildings on Site. A specialist flood alarm company will be appointed to provide alarm specification and installation.

Users of the Site are encouraged to evacuate before flood waters reach the Site on receipt of a Flood Alert and on sounding of the flood alarm system.

- A primary evacuation route from the north eastern extension through the main building and immediately west on Holden Lane to a grassed area adjacent to the Site's exit is proposed, travelling approximately 5m west. The route is allocated as Very Low hazard.
- A secondary evacuation route is possible from the northern extension through the main building and east on Holden Lane to a grassed area adjacent to the Site's entrance. This route is approximately 5m to the east of the Site and allocated as Very Low hazard.

If these routes are deemed unsafe users of the Site should seek refuge in buildings to the south of the Site and contact the emergency services.

The Site Owner will be responsible for the FWEP and should be registered to receive EA flood Alerts to ensure prompt action in the event of a flood event. Site specific procedures should be developed for disseminating appropriate information to users of the Site, and maintaining registers of occupants, given the nature of the proposed use.

The tables (checklists) included within Appendix B (including a contacts list) must be collated by the Site Owner and included within the flood risk information that is circulated to Site users. This FWEP should be reviewed after the first year and every three years after this.

9. References

British Geological Survey (BGS) (2022). Geology of Britain Viewer. Accessed from: http://mapapps.bgs.ac.uk/geologyofbritain/home.html on 11/04/2022.

Defra/Environment Agency (2005). Flood Risk Assessment Guidance for New Development. *Phase 2 Framework and Guidance for Assessing and Managing Flood Risk for New Development – Fill Documentation and Tools*. R & D Technical Report FD232-/TR2.

Environment Agency [EA] (2022). MagicMap. Accessed from: http://magic.defra.gov.uk/MagicMap.aspx on 13/04/2022.

Environment Agency [EA] (2022a). Flood map for planning. Accessed from https://flood-map-for-planning.service.gov.uk/ on 13/04/2022.

Environment Agency [EA] (2022b). Long term flood risk assessment for locations in England. Accessed from https://flood-warning-information.service.gov.uk/long-term-flood-risk on 13/04/2022.

GeoSmart (2022). FloodSmart Plus Flood Risk Assessment Report Ref: 76707R1.

GeoSmart (2022). GeoSmart groundwater flood risk (GW5) map (version 2.4).

Ministry of Housing, Communities and Local Government (2014). Planning Practice Guidance. Flood Risk and Coastal Change. Accessed from http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/ on 13/04/2022.

Ministry of Housing, Communities & Local Government (2021). National Planning Policy Framework (NPPF). Accessed from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf on 13/04/2022.

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Survey Open Data (2022). Accessed from: http://www.geostore.com/environment-agency/survey.html#/survey/tandc on 13/04/2022..

10. Glossary

General terms

BGS	British Geological Survey
EA	Environment Agency
Dry-Island	An area considered at low risk of flooding (e.g. In a Flood Zone 1) that is entirely surrounded by areas at higher risk of flooding (eg. Flood Zone 2 and 3)
Flood resilience	Flood resilience of wet-proofing accepts that water will enter the building, but through careful design will minimise damage and allow the re-occupancy of the building quickly. Mitigation measures that reduce the damage to a property caused by flooding can include water entry strategies, raising electrical sockets off the floor, hard flooring.
Flood resistance	Flood resistance, or dry-proofing, stops water entering a building. Mitigation measures that prevent or reduce the likelihood of water entering a property can include raising flood levels or installation of sandbags.
Flood Zone 1	This zone has less than a 0.1% annual probability of river flooding
Flood Zone 2	This zone has between 0.1 and 1% annual probability of river flooding and between 0.1% and 0.5 % annual probability sea flooding
Flood Zone 3	This zone has more than a 1% annual probability of river flooding and 0.5% annual probability of sea flooding
Functional Flood Plain	An area of land where water has to flow or be stored in times of flood.
Hydrologic model	A computer model that simulates surface run-off or fluvial flow. The typical accuracy of hydrologic models such as this is ±0.25m for estimating flood levels at particular locations.
OS	Ordnance Survey
Residual Flood Risk	The flood risk remaining after taking mitigating actions.
SFRA	Strategic Flood Risk Assessment. This is a brief flood risk assessment provided by the local council.

Sources of flooding

Fluvial/Coastal Flooding	This occurs when the river and watercourses overtop or breach its embankment and defences/ or flood due to high tides in seas and estuaries
Groundwater flooding	This occurs when the water table rises above the ground surface or into man-made ground
Reservoir flooding	The risk of flooding should there be a catastrophic failure of a large reservoir (holding over 25,000 m^3 of water) wall or embankment.
Sewer flooding	Occurs during extreme rainfall events when the capacity of combined storm drains and sewers is exceeded which can potentially lead to flooding from the sewer network at the ground surface.
Surface water (pluvial flooding)	This is usually associated with extreme rainfall events but may also occur when rain falls on land that is already saturated or has a low permeability. In each case, the rainfall generates overland flow which can lead to flooding before the runoff is able to enter a sewer or watercourse or 'ponding' in localised topographical depressions.

NPPF (2021) terms

Essential infrastructure	Essential infrastructure includes essential transport infrastructure, essential utility infrastructure and wind turbines.
Water compatible	Water compatible land uses include flood control infrastructure, water-based recreation and lifeguard/coastal stations.
Less vulnerable	Less vulnerable land uses include police/ambulance/fire stations which are not required to be operational during flooding and buildings used for shops/financial/professional/other services.
More vulnerable	More vulnerable land uses include hospitals, residential institutions, buildings used for dwelling houses/student halls/drinking establishments/hotels and sites used for holiday or short-let caravans and camping.
Highly vulnerable	Highly vulnerable land uses include police/ambulance/fire stations which are required to be operational during flooding, basement dwellings and caravans/mobile homes/park homes intended for permanent residential use.

11. Appendices

GeoSmart Information

Appendix A

Flood Kit List

A basic flood kit should contain:

- Waterproof clothing
- First aid kit
- Bottled water
- Wind up torches
- Wind up radio
- A fully charged mobile phone
- Tinned and non-perishable food, and a tin opener
- Blankets

A basic first aid kit should contain:

- Plasters
- Sterile gauze dressing
- Sterile eye dressing
- Bandages
- Safety pins
- Sterile gloves
- Tweezers
- Scissors
- Cleansing wipes
- Antiseptic wipes

(An extensive list can be found on NHS website)

GeoSmart Information

Appendix B

Check Lists

Flood Warning and Evacuation Plan for: John Metcalfe	Dated: 13/05/2022
Registered address: Holden Clough Nurseries Bolton by Bowland Lancashire	
Postcode: BB7 4PF	

Emergency contacts

Service*	Contact information
Emergency Services	999
Ribble Valley District Council Environmental Services	01200 425111
Ribble Valley District Council Emergency Helpline	01200 444448
EA Flood Alerts	0345 988 1188

*Always phone the emergency services (999) in the event of an actual emergency and the risk management authorities, including Ribble Valley District Council's Emergency Planning Team as they will liaise with each other to respond in the best and most timely manner.

Key contacts

Service	Company Name	Contact information
Electricity supplier and meter number		
Gas supplier and meter number		
Water supplier and meter number		
Telephone provider		
Local authority emergency services		
Insurance company 24-hour number and policy number		
Insurance agent		
Local radio station for news alerts and weather updates		

Site contact list

This section must be completed by the Site Owner and updated monthly or with any change in organisational hierarchy or appointment.

Name	Surname	Telephone/Mobile	Emergency Contact	Emergency Telephone and Address

Users of the Site/team members who may require assistance in the event of a flood

This section must be completed by the Site Owner and updated monthly or with any change in organisational hierarchy or appointment.

Name	Location

Key Locations

This section must be completed by the Site Owner and updated monthly or with any change in utility provider.

Service Cut-off	Location	Shut down procedure
Electricity (Electrical equipment must not be touched while standing in flood water)		
Gas		
Water		
Oil based products (gasoline, oil, cooking oil etc.)		
Chemicals (including cleaning products)	-	-

Emergency kit locations

This section must be completed by the Site Owner and updated monthly or with any change in first aid / flood kit locations.

First Aid Kit Locations	Flood Kit Locations

Sensitive items

This section must be completed by the Site Owner and updated monthly or with any change in sensitive item locations.

Valuable/Sensitive Item	Protective Action	New Location (if applicable)	Action Completed?

Suggested basic materials to help protect the site

This section must be completed by the Site Owner and updated monthly or with any change in basic materials.

Materials	Usage	Items to Protect/Where to use	Storage Location	Action Completed?
Sand and sand bags (unfilled), shovel or removable flood barriers	Creating flood barriers (used with plastic sheeting)			
Tools – hammer, nails, saw	Boarding up doors, windows and opening, creating shelves			
Wood – plywood, blocks of wood	Boarding up doors, windows and opening, creating shelves			
Sturdy plastic sheeting	Sandbag barriers, pulling up around furniture and appliances			
Strong plastic bags	Putting around legs of tables and chairs			

Emergency power generator	Maintaining function of air conditioning units (can help dry out a building) or lighting, running fridges and freezers, medical equipment if appropriate,			

Appendix C

Site plans

Outline of previously approved planning approval

Proposed new inset solar panels to sit flush with surface of slate roof covering

Garden Pod

Bungalow

Terrace

Loading Area

Proposed Site Plan

Scale (1:500)

D.	Amended at the request of the client	23/03/21
C.	Amended at the request of the client	02/03/21
B.	Additional information noted on plan	10/12/21
A.	Position of Glass extension relocated	27/10/21
Revision		Date

HOLDEN Lancashire Limited

83 Blackburn Road,
Rishton, BB1 4ER

Mob: 07738162386
Email : james@holdenlancs.com
Web: www.holdenlancs.com

Drawing Title:
Proposed Plan

Site Location:
Holden Clough Nurseries, Holden Lane, Holden, Bolton by Bowland, BB7 4PF

Drawing Status:
Proposed Site Plan

Date: 07/07/20

Drawn by: JHolden

Scale: 1:500@ A3

Ref: 20-02

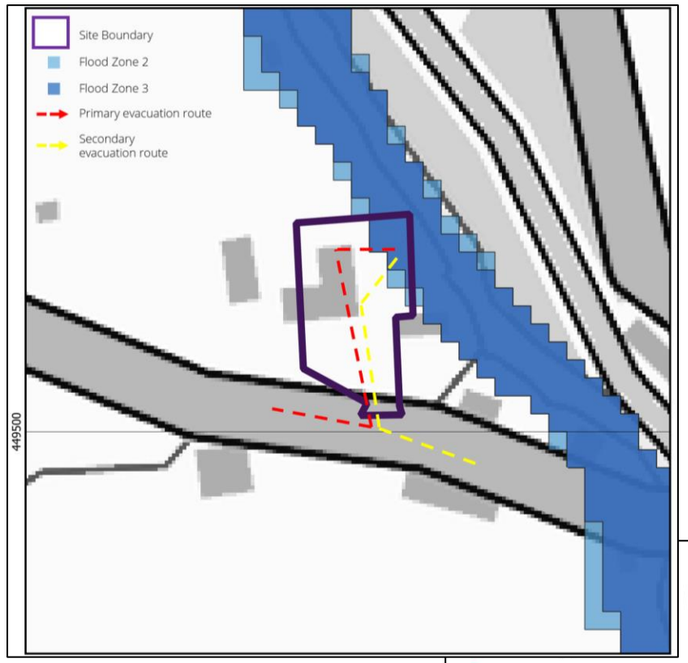
Revision: D.

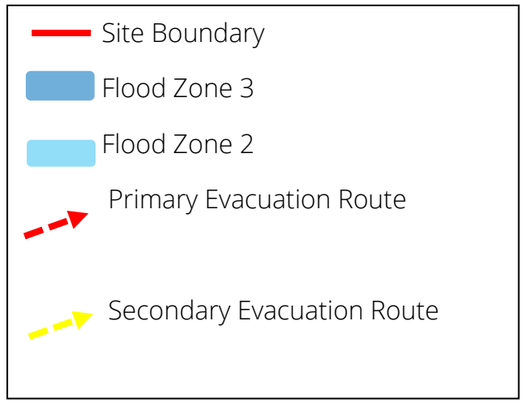
Client:
Mr J. Foley

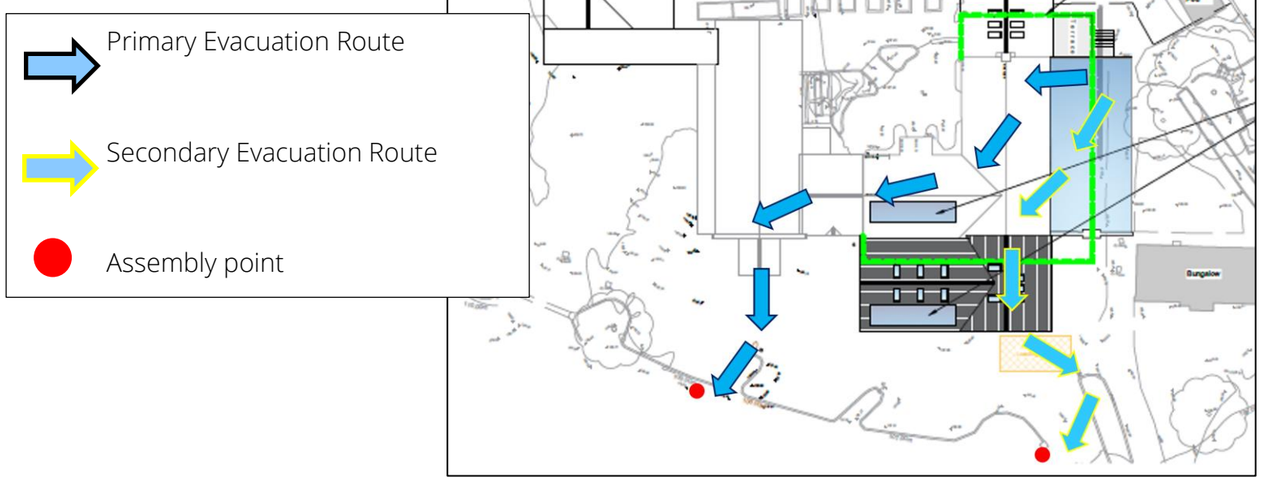
Appendix D

FWEP communal area poster

Flood Warning and Evacuation Plan: Holden Clough Nurseries, Bolton by Bowland, Lancashire, BB7 4PF







Flood Risk: The Site is affected by fluvial flooding from The Mear Gill River (adjacent to the north east of the Site). This plan is provided to raise awareness of risk and provide a plan to ensure site workers and residents safety in the event of a flood event and subsequent evacuation.

Evacuation Plan: Site Owner to ensure windows and doors of the ground and first floor are securely locked.

Site evacuation:

A primary evacuation route from the north eastern extension through the main building and immediately west on Holden Lane to a grassed area adjacent to the Site's exit is proposed, travelling approximately 5m west. The route is allocated as Very Low hazard.

A secondary evacuation route is possible from the northern extension through the main building and east on Holden Lane to a grassed area adjacent to the Site's entrance. This route is approximately 5m to the east of the Site and allocated as Very Low hazard.

On-site Refuge: If evacuation is unfeasible or deemed unsafe users of the Site should seek onsite refuge. At least one flood kit, one emergency pack and emergency lighting should be provided within each area identified within this report.

Re-occupation: The EA will confirm when the Site is safe for reoccupation. Under no circumstances should users of the Site attempt to gain access to the Site before this time. When this confirmation is received, the Site Owner will re-enter the Site and buildings and assess safety. The Site Owner will then be responsible for assessing utilities and organising a clean-up operation if it is needed.

Important Contact Numbers:

- Emergency Services:
  999.
- Flooding from a main river: Environment Agency Floodline number:
  0345 988 1188.
- Flooding from public sewers and mains: Contact United Utilities on:
  0345 672 2888.
- Ribble Valley District Council Emergency Helpline
  01200 444448.
- Ribble Valley District Council Environmental Services
  01200 425111.

12. Disclaimer

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Tel: 01743 298 100

Email: info@geosmartinfo.couk

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The Property Ombudsman scheme
Milford House
43-55 Milford Street
Salisbury
Wiltshire SP1 2BP
Tel: 01722 333306
Fax: 01722 332296
Email: admin@tpos.co.uk

You can get more information about the PCCB from www.propertycodes.org.uk.

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Complaints should be sent to:

Martin Lucass
Commercial Director
GeoSmart Information Limited
Suite 9-11, 1st Floor
Old Bank Buildings, Bellstone
Shrewsbury
SY1 1HU
Tel: 01743 298 100
martinlucass@geosmartinfo.co.uk

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CDM regulations can be found on our website:

http://geosmartinfo.co.uk/knowledge-hub/cdm-2015/

Data use and limitations can be found on our website:

http://geosmartinfo.co.uk/data-limitations/