

UPPER RESERVOIR

ON-SITE PLAN FOR RESERVOIR DAM INCIDENTS

06 March 2009

(Company Logo)

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1. RESERVOIR / PLAN DETAILS

Reservoir Location

Reservoir Road, Epsom, Surrey. KT18 5BW.
Grid Reference: SD 215684

See location/directions map in Appendix A.

Reservoir Owner

Epsom Council
10 High Street, Epsom, Surrey KT18 2HF
Ph. 01372 523500
After Hours: 01372 523230

Reservoir Use

Water supply for the town of Epsom.

Reservoir Type

Earth embankment with clay core.

Supervising Engineer

George Mitchell (Dam Consulting Ltd.)
5 Lake Road, Epsom, Surrey, KT18 7GH
Ph. 01562 524511
Mobile: 07773 015484

Plan Contents

Purpose

To ensure that relevant staff are aware of their responsibilities and the process to be followed in the event of a possible, probable or actual dam incident at Upper Reservoir.

Scope

From: The planning of what is required and what actions are to be taken, should a reservoir incident arise, to reduce the impacts of the incident.

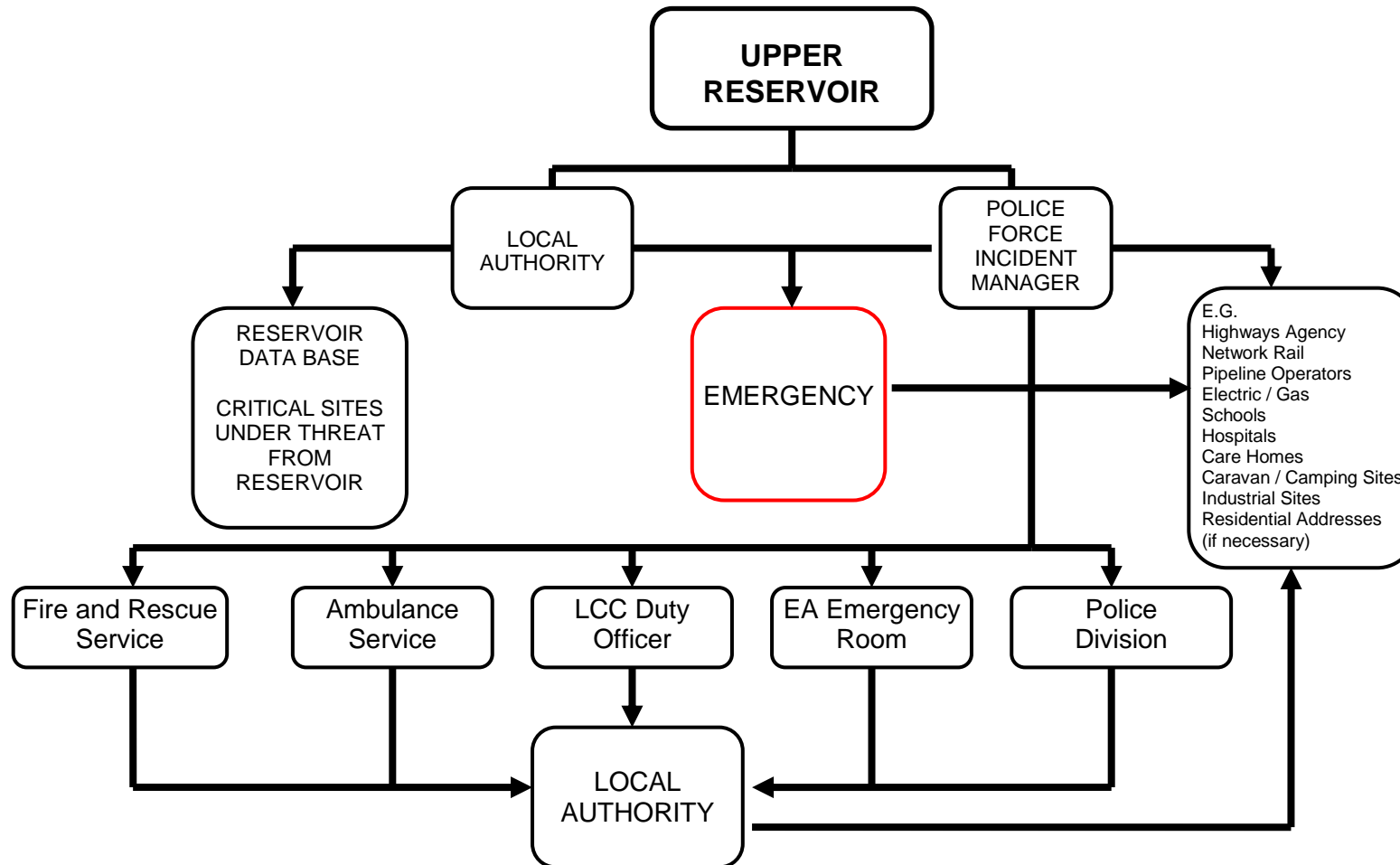
To: How to undertake the required actions during an actual reservoir incident.

References

Section 10 Report.

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2. RESERVOIR INCIDENT ALERT



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3. ON-SITE ACTION AND TRIGGER LEVELS

STAGE	STATUS	DETAILS OF TRIGGER(S)	UNDERTAKER'S ACTIONS	LOCAL RESPONDERS' ACTIONS
<p>STANDBY (dam breach possible)</p>	<p>ALERT</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Earthquake/landslip affects local area. <input type="checkbox"/> Movement in dam crest/slope/toe. <input type="checkbox"/> Instrumentation reading exceeds predefined levels. <input type="checkbox"/> Uncontrolled release of water, embankment/tunnel etc. <input type="checkbox"/> Movement in up or downstream embankment. <input type="checkbox"/> Advice from Inspecting/Panel Engineer. 	<ul style="list-style-type: none"> <input type="checkbox"/> Arrange immediate visit by Supervising and/or Inspecting Engineer. <input type="checkbox"/> Increase frequency of readings and surveillance. <input type="checkbox"/> Consider notifying the Police and LA when there is any on-site activity related to a significant potential problem 	<ul style="list-style-type: none"> <input type="checkbox"/> Police/LA may contact all relevant partners to place on standby.
	<p>ADVISORY</p>	<ul style="list-style-type: none"> <input type="checkbox"/> A structural problem in the dam has been detected or reported to the Undertaker. <input type="checkbox"/> A precautionary drawdown is to be carried out to reduce the likelihood of failure to an acceptable level. 	<ul style="list-style-type: none"> <input type="checkbox"/> Undertaker reports details of incident to Police and Local Authority. <input type="checkbox"/> Undertaker attends scene and provides updates to local responders and Supervising Engineer. <input type="checkbox"/> Undertaker implements On-site Plan and relevant actions in conjunction with relevant Engineer. 	<ul style="list-style-type: none"> <input type="checkbox"/> Police contact relevant Cat 1 (Local Authority, EA etc) and Cat 2 partners to place on standby. <input type="checkbox"/> Police, in conjunction with Cat 1 partners, consider possible activation of Tactical (Silver) Control on precautionary basis to review procedures, undertake relevant forward planning including evacuation, public information and warning. <input type="checkbox"/> Police, in conjunction with Cat 1 partners, consider possible activation of Strategic Coordinating Group (Gold Control) on precautionary basis to review procedures and undertake relevant forward planning including evacuation, public information and warning.

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4. OFF-SITE ACTION AND TRIGGER LEVELS

STAGE	STATUS	DETAILS OF TRIGGER(S)	UNDERTAKER'S ACTIONS	LOCAL RESPONDERS' ACTIONS
IMPLEMENTATION (dam breach imminent dam has failed)	ALARM	<input type="checkbox"/> An emergency drawdown is required to avert failure of dam structure.	<input type="checkbox"/> Undertaker attends scene and provides updates to local responders and Supervising/Inspecting Engineer. <input type="checkbox"/> Undertaker implements On-site Plan and relevant actions to mitigate failure or limit impact in conjunction with the relevant Engineer.	<input type="checkbox"/> Police activate and implement Off-Site Plan in conjunction with partners and undertake all necessary mitigatory actions. <input type="checkbox"/> Police implement all relevant multi-agency command and control arrangements with participation of Undertaker and relevant Engineers.
	IMMINENT FAILURE	<input type="checkbox"/> Control of the reservoir has been lost and failure is inevitable.		
	FAILED	<input type="checkbox"/> The dam has failed and large uncontrolled release of water has occurred.		
STAND-DOWN (floodwaters subsided or return to properties permitted).	POST – STANDBY	<input type="checkbox"/> Serious problem averted.	<input type="checkbox"/> Undertaker agrees and implements any urgent recommendations from the relevant Engineers.	<input type="checkbox"/> 'All clear' given. <input type="checkbox"/> Cat 1s review plans in light of response and any ensuing recommendations.
	POST-IMPLEMENTATION	<input type="checkbox"/> Water flows from the reservoir are minimal and efforts are focussed on consequences in zones of total and partial devastation.		<input type="checkbox"/> Cat 1s focus on on-going response and recovery operations affecting the needs of local populations, buildings, critical infrastructure etc.

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5. ON-SITE ROLES AND RESPONSIBILITIES

Role	Typically undertaken by	Responsibilities include
Incident Controller (IC)	The Treatment Manager or Area Manager	<ul style="list-style-type: none"> • Direction of staff in the field associated with any aspect of the incident response. • Implement a range of measures to avert failure including the on-site plan. • Agreement of overall response & recovery strategy with Incident Manager. • Providing ongoing surveillance and situation assessments. • Communication with Incident Manager. • Overall H&S of all personnel addressing incident. • Liaison with emergency service leaders on site.
Marshalling Officer	The IC or their appointee	<ul style="list-style-type: none"> • All staff arriving on site must 'check in' with the marshalling officer and 'check-out' when leaving. • Checking on continuity of response, i.e. that if someone is leaving site their responsibilities are either fully executed or properly handed over. • Providing of safe approach routes to the emergency services. • Assists in information flows to incident team at downstream Lower Reservoir via the Information Officer.
Problem Assessment Team	Headworks Controller; Reservoir Safety Manager; Supervising and Inspecting Engineers	<ul style="list-style-type: none"> • Assesses the problem • Agree responses with IC and Incident Manager • Monitor reservoir & Assess response • Report outputs to Information Officer • Valve operations (Headworks Controller)
Emergency Plant Controller	B level manager with engineering delivery experience	<ul style="list-style-type: none"> • Agrees technical solutions with Panel Engineer, Reservoir Safety Manager and Incident Manager. • Leads delivery on the ground of agreed solution with Partners and other suppliers
Press Officer	Press Officer or nominee	<ul style="list-style-type: none"> • To collate information for Comms Team, sole point of contact on site for central Comms Team.
Information Officer		<ul style="list-style-type: none"> • Info flows to Incident Team / task teams • Maintaining a log. • Record keeping.
Administration Officer		<ul style="list-style-type: none"> • Staff welfare, accommodation & meals, • Rotas for local incident control personnel. • Accommodation for staff drawn in from other areas. • Working Time Directive monitoring.

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6. INCIDENT MANAGEMENT PROCEDURE

An impending dam failure at impounding reservoirs, or a structural failure of a service reservoir covered by the Reservoirs Act 1975, will be managed in accordance with **Epsom Council Operational Incident Management Procedure.**

Local Incident Control

Local incident control is the structure in which the field based response to an incident operates (aka the Incident Controller's (IC) team). It refers to essential activities and how they are organised.

Formal incident control is an essential element of managing MINOR and MAJOR incidents at our reservoirs.

The IC is the leader of all staff in the Field. To ensure properly coordinated response, all other personnel must ensure that the IC is aware of and approves of their activities.

The IC agree with the Duty Manager where local incident control is to be established, it could be one of the following:

- fixed safe marshalling point at the site of the incident perhaps with mobile incident centre
- local office or depot; third-party office (e.g. Police Station, Local Authority Offices, etc)

In choosing the location, consider the following:

- How many people are likely to arrive on site and for how long? What are the duties they will need to undertake?
- How will they be briefed and coordinated?
- Safe car parking and health and safety when undertaking their work.
- How will any public and media who assemble at the site be managed?
- If it is to be an operational site, is the normal business or treatment process at that site secure?
- Will you need office facilities for: incident meetings, communication with the Incident Team at Lower Reservoir, welfare etc?

All staff must be aware that if they arrive on site and commence activities they are responsible for ensuring the handover/ continuity of those activities when they leave site.

The IC will appoint personnel to cover the following roles (or agree with the Incident Manager why a particular role is not required). Individuals may be asked to cover more than one role. Additional staff may be needed to be drafted into the area to undertake roles. If a role cannot be filled locally the Incident Manager should resource it from the wider business.

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7. MAINTENANCE OF ON-SITE PLAN

Exercises

The table below outlines the frequency of exercising of this On-site Plan, the type of exercise and what the exercise is to involve.

Annual Review	Exercise Level 1	Exercise Level 2
<p>Annual review of On-site Plan by author including management approval.</p> <p>Review to include all front-line personnel who operate the reservoir.</p>	<p>When required, participate in exercise of Off-site Plan for reservoir (which will be lead by a Cat 1 organisation) and any On or Off-site Plan exercise involving the downstream Lower Reservoir.</p>	<p>One full exercise per year for Council (on rotational basis).</p> <p>Exercise to involve all personnel in Council with a role in responding to a major reservoir incident, and is to include:</p> <ul style="list-style-type: none"> • deployment of staff and emergency equipment as per plan requirements. • involvement of Supervising or Inspecting Engineer. • operation of valves and drawdown facilities. • participation of organisations managing the downstream Lower Reservoir. • relevant Cat 1s should be invited as observers.

Testing Equipment

The testing of emergency draw-down equipment is to be carried out in accordance with the Draw-down Operations Manual.

Plan Updates and Review

The review and update of this On-site Plan should be undertaken as follows:

- As part of the Section 10 Inspection; and
- Following every exercise of the On-site Plan.

The On-site Plan should be updated if any details or information in the plan changes as a result of the exercises. The 'document history' table at the front of this plan should be updated following any review and update.

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DATA SHEETS

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DATA SHEET A – Contact Details

Role	Name / Job Title	☎ Office	☎ Home	☎ Mobile
Undertaker's 24 hr emergency incident reporting no.				
Undertaker's Responsible Officer				
Undertaker's Reservoir Safety Manager				
Contact for Access to Site				
Inspecting Engineer*				
Supervising Engineer				
Police				
Lower Reservoir Undertaker (reservoir downstream)				
EA / DEFRA emergency contact numbers				
Local Authority Emergency Planning 24-hour number				
Multi-Agency Control Room Telephone No's.				

* NB Reservoir Inspecting Engineers are usually appointed by the Reservoir Safety Manager to carry out 10 year Statutory Inspections. In the absence of the Reservoir Safety Manager, and the Supervising Engineer, one of the following should be contacted for advice or to conduct an inspection/investigation.

Mobile Phone Reception Details

There is mobile network coverage for the majority of site from all the major mobile networks. Vodafone can be poor at the downstream toe of the dam at times.

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DATA SHEET B – Communities at Risk

Insert outline breach inundation map here

1. *This map and the information contained within it remain the property of the Environment Agency. It may not be copied, scanned (or reproduced in any format), or transmitted in any way other than those which are set out in the latest version of the national protocol issued by Defra in relation to information sharing of data, maps and intelligence in relation to dams and reservoirs for England and Wales*
2. *This map IS NOT INTENDED FOR any use other than for lawful purposes by bodies responsible for emergency planning who should follow their own appropriate procedures for such purposes.*
3. *The information contained in this map DOES NOT in any way reflect the structural integrity or likelihood of failure of the dam.*
4. *This map gives an indication only of the areas that may be flooded if the dam completely failed. It is based on a simplified modelling approach. Actual reservoir failure may give rise to conditions (flooded areas, flood depth, extent, velocity, hazard, and timing) which vary from those indicated.*
5. *The data used to create this map was gathered from various independent sources. Defra and the Environment Agency have no control over the quality of the input data and accept no responsibility for same.*
6. *To the extent permitted by law, neither Defra nor the Environment Agency shall be liable to a party using this map in contract, tort, negligence, breach of statutory duty or otherwise for any loss, damage, costs or expenses of any nature whatsoever incurred or suffered by that other party whether or a direct nature (whether such losses were foreseen, foreseeable, known or otherwise) or of an indirect or consequential nature including without limitation any economic loss or other loss of turnover, profits, business or goodwill.*

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DATA SHEET C – Reservoir Operational Data

Location Details

Location: Leave M25 at J9 and take A24 in northerly direction for approximately 2.2 miles, then turn right into Reservoir Road and follow for approximately 1.3 miles to the reservoir on the left side of the road.

Grid reference: SD 215684

A4 Location / directions map with scale: See map attached in Section 1

A4 Sketch of valve location and operation: See sketch attached in Draw-down Operations Manual

Site plan located at: Reservoir site office and Council Offices, Epsom.

Details of Dam

Name: Upper Reservoir

Use: Drinking water supply

Type: Earth fill with clay core

Date built: 1942

Height: 21 m

Crest length: 168 m

Overflow / top water level: 160.5 mAOD

Total storage capacity: 150,000

Design flood category: Category A

Outflows and Controls

Number and Type: 001 – Ø400 mm scour pipe

Discharge Capacities: 20.5 cumecs

Number of Scours: 1

Reservoir Capacities

Drawdown from TWL	Outflow Volume (ML)	Maximum Rate of Discharge	Time taken for Draw Down
1m down:	400	20.5 cumecs	24 hrs
2m down:	350	20.5 cumecs	24 hrs
3m down:	300	20.5 cumecs	24 hrs
4m down:	250	20.5 cumecs	24 hrs
5m down:	200	20.5 cumecs	24 hrs

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Reservoir Operation

The Reservoir supplies:	The town of Epsom
Average Daily Volume:	12 ML
The Reservoir also supplies:	Northern area of Ashtead

Impact of Failure on Undertaker Operations

Shutdown of entire drinking water supply to Epsom.

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DATA SHEET D – Emergency Draw-Down Procedure

1) Authorisation for Draw-Down from:

- a) Reservoir Safety Manager; or
- b) Reservoir Supervising Engineer.

2) Inform (Internal)

Action normally undertaken by: Headworks Controller/Duty Manager

Reservoir Safety Manager
Reservoir Supervising Engineer
Duty Manager Operational Response Manager
Treatment Manager
And others according to Company Incident Procedure

3) Inform (External)

Action normally undertaken by: Incident Manager

Environment Agency
Police
Local Authority Emergency Planning Unit

4) Equipment Required

Pumps, generators, pontoons and required location as per requirements of Draw-down Operations Manual.

5) Initiation

Manual operation of penstocks and valves at the site – Valves to be opened and closed in sequence as per the Draw-down Operations Manual.

6) Control

The normal acceptable rate of draw down is 300mm per day. In an emergency this may be increased to 1000mm per day following authorisation from either the Reservoir Safety Manager or the Reservoir Supervising Engineer.

7) Additional Requirements

None.

8) Monitoring On-site

See reservoir Monitoring Plan for monitoring required during draw-down.

9) Reservoirs Downstream

Lower Reservoir, 1 mile downstream. Draw-down operations are not likely to affect Lower Reservoir however owner to be notified prior to draw-down initiation.

10) Rain Gauges

One at the site office.

11) River Gauging Stations On-site

None.

12) Potential Flooding

The main by-pass from the overflow flows under the nearby A75 and therefore the bar screen at this point will need to be cleared and re-checked for blockage during any emergency draw-down; liaison

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with local authority will be required. **Emergency drawdown will result in high flows through the downstream town which will be very obvious public.**

13) Inflow Controls

No by-wash channel. Stop logs available if required.

14) Diversions

None.

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DATA SHEET E – Emergency Plant and Safe Access Routes

Access Routes For Vehicles	Access to toe possible. Access to the crest only from the left abutment (would need to dig an access road).
Parking	Parking for up to 20 vehicles adjacent dam crest and further parking available along access road.
Suitability for Use of Siphons	Yes
Suitability for Deployment of Pontoons	Yes – but could have access issues
Suitability for Use of High Volume Pumps (Fire Service)	Yes – to toe
Configuration of Other Pumping	No
Additional Information	Access road across crest is narrow.
Marshalling Point	Adjacent to overflow channel. See Appendix A plan for location.
Footpath	Path across the crest, although not public it is used by walkers.

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DATA SHEET F – Reservoir Construction Drawings

Insert reservoir construction drawings.

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DATA SHEET G – Contractor Contact Details

Pump Hire:

Contractor		Telephone Numbers
Name:	Andrew Sykes Hire Ltd	Day time: 01372 256012 07772 157459
Address:	Epsom	Out of Hours: 07772 157459
Type of Service / Equipment:		Portable water pumps.

Contractor		Telephone Numbers
Name:	All Purpose Pumps Ltd	Day time: 01372 249875 07772 657697
Address:	Ashtead	Out of Hours: 07772 657697
Type of Service / Equipment:		Portable water pumps.

Civil Contractors:

Contractor		Telephone Numbers
Name:	Williams Excavators	Day time: 01372 459784 07772 542863
Address:	Epsom	Out of Hours: 07772 542863
Type of Service / Equipment:		Excavators, backhoes.

Earth fill Suppliers:

Contractor		Telephone Numbers
Name:	Epsom Building Supplies Ltd	Day time: 01372 265148 07772 125469
Address:	Epsom	Out of Hours: 07772 125469
Type of Service / Equipment:		Sand, gravel and clay backfill supplies.

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DATA SHEET H – List of Key Documents

Document Title	Document Reference	Document Storage Location
Operational Incident Management Procedure	CO/100/1	
Assessing the Incident Checklist	CO/100/1-F1	
Template for a Post Incident Review Report	CO/100/1 Appendix 10	
Reservoirs Manual (also known as WMG008) – refer to WSI 9 Series on the HUB	RM90/1	Reservoir Safety Manager Office
Corporate Emergency Response Plan	Corporate Emergency Response Plan	Council Offices
Data Files for individual dams	Data Files for individual dams	Council Offices
Inundation plans – Impounding reservoirs only	Inundation plans – Impounding reservoirs only	Incident Room
Incident Closure & Incident Closure Checklist	CO/100/1-F8	
Alternative Supplies	COD/04/01	

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DATA SHEET I – Plan Distribution Details

The people identified in the following table hold a copy of this On-site Emergency Plan for Upper Reservoir.

Name	Position	Organisation	Reference No.	Version
David Kennedy	Incident Controller	Epsom Council	R101	V001
John Davis	General Manager	Epsom Council	R102	V001
Mark Simons	Manager	Local Authority	R103	V001

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DATA SHEET J – Additional Information

N/A