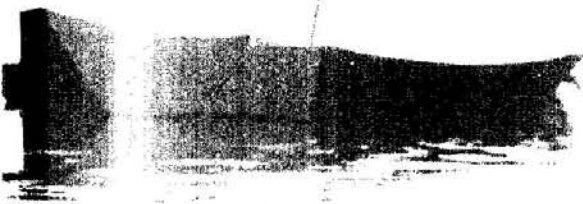


Flood Prevention Report 2001



Dundee
City Council

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Cover photograph courtesy of the Courier and Evening Telegraph Dundee

**REPORT IN TERMS OF SECTION 3 OF THE FLOOD PREVENTION AND LAND
DRAINAGE (SCOTLAND) ACT 1997**

1 BACKGROUND

1.1 On 26 May 1997 the Flood Prevention and Land Drainage (Scotland) Act 1997 came into force. This placed a duty on local authorities to:

- assess watercourses in their area from time to time to determine whether their condition is likely to cause flooding;
- carry out maintenance works on watercourses which would significantly prevent or mitigate the likelihood of flooding; and
- to prepare and publish reports.

The 1997 Act limits Local Authorities responsibilities to the flooding of non-agricultural land. Where any flood prevention works would benefit only one person or organisation, then the Local Authority is not required to carry out such works.

1.2 The first report was published in December 1997 and it is a requirement of the act to publish further reports every two years setting out:

- all occurrences of such flooding since that date;
- the measures which have been taken since the date of publication of their previous report; and
- the measures that are required to prevent or mitigate the flooding of non-agricultural land in their area;

1.3 The purpose of publishing these reports is to ensure that local people and other interested parties have ready access to local authority records and information with regard to flooding in their area. This report is the third to be published.

1.4 The City Council seeks the participation of the citizens of Dundee in providing information on flooding within the City. This report sets out the current position as far as it is known and proposes appropriate future action.

Anyone who has additional information on known flooding risk areas which have not been identified in this report is invited to bring it to the attention of:

The City Engineer
Planning and Transportation Department
Crichton Street Dundee City Council
Floor 14, Tayside House

DUNDEE DD1 3RB

2 IDENTIFICATION OF WATERCOURSES

A schedule of all watercourses within the Council's boundaries has been prepared and is set out in Appendix 1. The map in Figure 1 shows the location of all known watercourses and is based on information gathered from historical records. Many of the watercourses have been culverted or piped below ground level at some time in the past and have subsequently been either diverted for industrial purposes in earlier times or more recently moved to make way for development works. Accordingly, precise records have been difficult to obtain. Where there is doubt over the exact line of a watercourse, the anticipated line has been shown as a broken line on the plan.

The main watercourses which affect the city are:

- River Tay;
- Dighty Water and its tributaries, the Gelly, Fithie and Murroes Burns;
- The Logie Spout/Scourin' Burn;
- Lochee Burn; and
- Dens Burn.

3 REVIEW OF FLOODING EVENTS SINCE DECEMBER 1999

There have been a number of minor events which have occurred resulting in localised road flooding although it is not intended to deal with these within this report. Such local events are generally associated with blocked surface water drainage systems, combined with intense rainfall events.

Since the previous report in 1999, there have been two significant flooding events which have resulted in damage to property and major disruption. These are noted below:

3.1 Gelly Burn - Ardler Central Core Flooding

In December 2000, the central shopping area within Ardler was flooded as a result of the Gelly Burn over-topping the inlet grille at the entry to the closed culvert section.

The over-topping of the culvert inlet resulted in some flooding of the adjacent shopping precinct. The incident was dealt with promptly by Tayside Fire Brigade who managed to divert the flood water into the road drainage system.

3.2 River Tay - Dundee City Centre Flooding

The central area of Dundee suffered significant flooding within the Allan Street area in July 2001. In addition, flooding of basements throughout the City Centre Area was encountered. The flooding was occasioned by severe rainfall coinciding with a high tide resulting in surface water backing-up within the drainage system and resulting in flooding within the above area.

4 MEASURES TAKEN SINCE DECEMBER 1999

4.1 Assessment of Watercourses

The 1997 Act requires the Council to assess watercourses from time to time to establish whether or not their condition is likely to lead to flooding of non-agricultural land. Inspections have been carried out, concentrating particularly at known flood risk areas, during periods of heavy rainfall.

4.2 Flood Alleviation Operations

- 4.2.1 Since the last biennial report, a number of flood alleviation operations have been carried out throughout the City. Works have been completed to the Gelly Burn at Ardler as part of a major redevelopment of the area which will help alleviate the risk of flooding. These works involved the construction of two significant detention ponds together with the formation of swales to deal with surface water flooding in this area. Initial problems with the establishment of vegetation within the swales which led to previous flooding events, have now been resolved. Since their completion, the detention ponds have functioned well and no flooding has occurred in this area.

As a result of the completion of these works, the Flood Risk Category for locations 10, 11 and 13 have been downgraded from Category 1 to Category 2 and locations 12 and 14 from Category 2 to Category 3, refer Figure 2.

- 4.2.2 The Dock Street relief tunnel in the City Centre is nearing completion. This project, together with the recently completed Tay Wastewater Project will help alleviate much of the incidence of flooding within the City Centre Area.
- 4.2.3 As part of the Tay Wastewater Project, works are being carried out to build an extended footpath and nominally raise the seawall at the sensitive Fisher Street/James Place Section of the coastline at Broughty Ferry. Whilst this work only provides a nominal additional protection to flooding at present, it does provide a platform to increase flood defences in this area at a later date.
- 4.2.4 The Dighty Environmental Group are a voluntary body, supported by the Council which has been carrying out much valuable cleaning up works of the Dighty. This work has included the removal of artificial obstructions which will help mitigate flooding of this watercourse.

4.3 Hydrological Studies

The Council in conjunction with University of Abertay, Dundee is continuing to develop detailed hydrological models of two of the main watercourses which run through the Council's boundaries. These are the Dighty Water and its tributary, the Gelly Burn. The areas covered by the current studies are illustrated in Figure 3.

The aim of these studies is to build up a detailed computer model of the watercourses and their catchment areas to enable predictions to be made on the likely consequences of future developments on the watercourses. The computer model shall also enable predictions to be made on the effects of carrying out maintenance or flood prevention works in specific locations.

A topographical study of the Fithie Burn has been recently completed, although this has yet to be included within the computer model.

4.4 **Flood Emergency and Warning Planning**

In the event of a major emergency involving flooding, the City Council has in place an integrated emergency management procedure which has four main aims:

- To clarify the roles of the organisations involved in dealing with emergencies;
- To ensure that the City Council are able to provide the resources at its disposal in dealing with the emergency;
- To provide information on the support and assistance available from the City Council and all other agencies and organisations; and
- To ensure that appropriate arrangements are in place to co-ordinate the City Council's response to such an emergency.

As part of the overall emergency plan a detailed section on 'Response Measures to Flooding Emergencies' has been drafted and recently issued.

As part of this procedure, the City Council has access to information from various sources to assist in the warning of potential flooding occurrences. Information on severe weather conditions, atmospheric surge conditions in the Tay estuary and predicted tide levels is collated. In addition, contacts have been made with the Scottish Environment Protection Agency (SEPA) who can provide information on flow levels due to extreme events such as snow melt combined with heavy rainfall with the Tay catchment area.

The information obtained from these various sources is analysed and used to predict the likelihood of flooding in low lying areas adjoining the estuary such as the Broughty Ferry area at Fisher Street where a combination of adverse conditions occasionally results in local flooding events. Similarly, for the other watercourses, meteorological information is used to assess the risk of flood events occurring. In addition, SEPA has now introduced a new telephone Floodline Service for the whole of Scotland. This provides public information on the possible risk of flooding 365 days a year 24 hours a day. Callers will receive details of any flood warnings in force in their area. There is also an option to speak to a duty officer if necessary. The service is based at SEPA's new communications centre in Perth. **The Floodline number is 0845 988 1188** and is also available on SEPA's web site.

4.5 **Flood Appraisal Group**

A formal Flood Appraisal Group has now been established and incorporates representatives from the City Council, the Scottish Environment Protection Agency, the North of Scotland Water Authority, Angus Council, Association of British Insurers and Railtrack. In addition the following organisations have an open invitation to attend and are circulated with minutes of meetings; Perth and Kinross Council, University of Dundee and University of Abertay.

This Group has now met twice and are due to meet at six monthly intervals.

4.6 **Development Control - SUD's Group**

All development within the City is controlled to ensure that it complies with the Guidance given in National Planning Policy Guidance NPPG 7 and that where appropriate, Sustainable Urban Drainage Systems (SUD's) are incorporated. This is achieved largely through the work of the SUD's Group which meets on a fortnightly basis.

This Group comprises representatives from Dundee City Council together with representatives from SEPA and NoSWA. They meet with developers and their Agent, to review proposed developments and to offer guidance on acceptable measures for dealing with surface water and to ensure that development does not encroach inappropriately into the flood plain.

5 FURTHER MEASURES TO BE TAKEN

5.1 Maintenance Inspection and Remedial Works

It is proposed to continue with regular inspections to monitor the condition of watercourses within the city boundaries. These inspections shall be carried out on a rolling programme and shall be prioritised with the areas of highest risk being targeted as requiring the greatest use of resources.

As a result of these inspections it may be necessary for the City Council to use its powers under the Flood Prevention (Scotland) Act 1961 to instruct maintenance works to be carried out. These powers would only be used where the maintenance works would substantially reduce the likelihood of flooding occurring and where the flooding is likely to affect more than one owner.

5.2 Identification of Capital Works

Where the inspections show that there is a requirement for more substantial works, other than routine maintenance, then consideration will be given to promoting a flood prevention scheme. Should such a scheme be required and funded from Capital then the Council would have to exercise its powers under the 1961 Act to promote such works.

5.3 Continuing Liaison

In order to help reduce the risk of flooding occurring in the future, it is vital that the City Council maintains and builds on its current links with other organisations and bodies. In order to achieve this, the City Council shall seek to develop closer links in this regard with the following organisations:

- Perth and Kinross Council;
- Angus Council;
- Scottish Environment Protection Agency;
- North of Scotland Water Authority;
- Scottish Natural Heritage; and
- Scottish Office Agriculture, Environment and Fisheries Department

5.4 Control of Future Development

Existing planning legislation already provides for the possibility of new development and must assess the risk of any such development in areas identified as being prone to flooding. In addition the National Planning Policy Guidance No 7 "Planning and Flooding" contains further detailed guidance on the inter-relationships between planning and flood risk issues.

Future development within the City shall continue to be controlled through the work of the SUD's Group in line with the National Planning Guidelines given in NPPG 7 and where appropriate, by reference to new national guidance in the form of the new design manual for Scotland & Northern Ireland; 'Sustainable Urban Drainage Systems' (S.U.D.S) this document is supported and promoted by amongst others, COSLA, SEPA, Scottish Water Authorities & Scottish Executive to deal with the disposal of surface water from development sites. To allow new development to

proceed, a balance has to be achieved between improving surface water disposal through the use of SUDS as recommended by SEPA and the requirement to reduce the risk of flooding. Such SUDS have the combined benefit of improving water quality and attenuating surface water discharges in order to minimise the risk of flooding downstream of the development.

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The Flood Prevention and Land Drainage (Scotland) Act 1997

The Flood Prevention (Scotland) Act 1961

National Planning Policy Guideline No 7 - "Planning and Flooding"
Scottish Office Environment Department

A Guide to Surface Water Best Management Practices - SEPA 1996
'Sustainable Urban Drainage Systems' (Design Manual for Scotland & Northern Ireland)
Sustainable Urban Drainage Scottish Working Party - 2000

Planning Advice Note 61

Planning & Sustainable Urban Drainage. July 2001

Watercourses and Culverts Appendix 1

Name	Length (m)	Watercourse Location
Dighty (open)	12192	Bridge at Baldovan to Estuary
Gelly Burn (open)	1219	Old Glamis Road to Claverhouse Road
Gelly Burn	3048	Macalpine Road/Dalmahoy Drive Old Glamis Road/Macalpine Road
Whitfield Burn (open)	2286	Berwick Drive to Fithie Burn
Whitfield	762	Berwick Drive
Fithie Burn (open)	1097	Rear of Pitkerro Mill to Dighty
Gorrie Burn (open)	1096	Pitempton Farm and west from Strathmartine Road parallel to Sidlaw Avenue
Gorrie	365	Bridge at Baldovan/Pitempton Farm and Strathmartine Road/Pitempton Farm
Invergowrie (open)	1676	Rear Swallow Hotel to Estuary
Murroes (open)	1036	Pitkerro House to Dighty
Lochee (open)	1341	Gourdie Industrial to Invergowrie Burn
Lochee	3047	Burnside Street/Gourdie Industrial Estate
Camperdown Park (open)	792	Through park
Camperdown	396	Liff Road/Kingsway
Clive Road (open)	152	Rear of houses at Clive Road at right angles to Gelly Burn
Back Burn (open)	243	Rear to sub-station at Macalpine Road parallel to Birkdale Place
Back Burn	2090	Macalpine Road/Strathmartine Road and Baldragon Academy/Dighty
Mause Burn	396	Commerical Street/Dock Street
Dens Burn	2636	Glenogil Avenue/Arthurstone Terrace and St Roques/East Dock Street
Logie Spout	1036	Victoria Park/Edward Street
Scouring Burn	1179	Edward Street/Ward Road
Ward Road	481	Length of Ward Road
Perth Road	198	Perth Road/Foreshore
Perth Road	182	Foreshore at 590 Perth Road
Foster Road	243	Foster Road/Gelly Burn
Kingsway	610	Tesco/Clive Road
Craigiebank	631	Arbroath Road/Craigie Avenue to Strips of Craigie
Claypotts	1829	Ferndale Drive/Church Street
Barnhill	1432	Strathmore Street/Monifieth Road
Tay (open)		Invergowrie/Barnhill

Flood Risk Locations

Appendix 2

No.	Name	Flooding Location	Flood Risk Potential	Flood Risk Category
1	Dighty (open)	Land between Harestane Road and Home Farm	Property damage and flooding or agricultural land	2
2		Dighty/Old Glamis Road junction	Flooding of local road	2
3		Land north of Trottick	Flooding of agricultural land	3
4		Land between Mill Ponds and Barns of Claverhouse Road	Recreational and property damage	1
5		Playing fields west of St Saviours school	Flooding of recreational ground only	1
6		Industrial land west of Forties Road	Property damage	2
7		Land between Pearce Avenue and Tom Johnstone Road	Flood plain	2
8		Land northwest of Lilac Cottage on A92 Arbroath Road	Flooding or agricultural land	3
9		Land west of Milton Park Monifieth	Property damage	
10	Gelly Burn	Dalmahoy Drive/Turnberry Avenue junction	Property damage	2
11		South of Primary school Turnberry Avenue	Property damage	2
12		Turnberry Avenue/Macalpine Road junction	Road flooding	3
13		Camperdown Road west of Strathmartine Road junction	Property damage	2
14		Gillburn Road south of Gillburn Primary School	Road flooding	3
15	Whitfield Burn (open)	Northwest of Berwick Drive/Ballumbie Road junction	Flooding of recreational ground	2
16	Fithie Burn (open)	Fithie/Drumgeith Road junction	Property damage	1
17	Gorrie Burn (open)	Gorrie Burn/Strathmartine Road junction	Property damage	1

Flood Risk Locations

Appendix 2

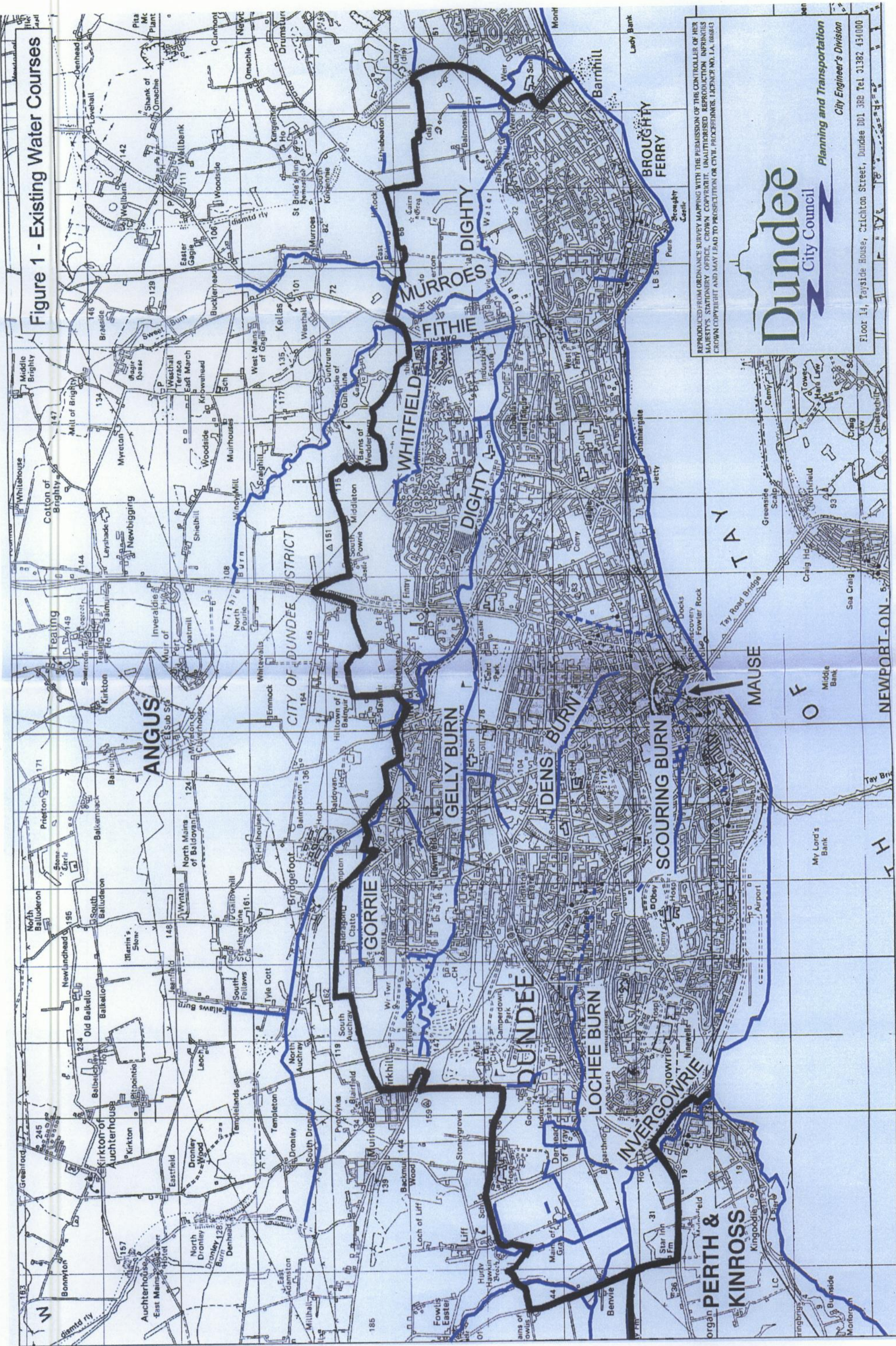
No.	Name	Flooding Location	Flood Risk Potential	Flood Risk Category
18	Gorrie	Farm land between Strathmartine Road and Pitempton Road	Flooding of agricultural land	3
19	Invergowrie (open)	Southwest of Swallow Hotel	Flooding of agricultural land	3
20		Pedestrian bridge and track	Pedestrian access problems	2
21	Murroes (open)	East end of Barlow Avenue	Flooding of agricultural land	3
22	Lochee	Bridge at Denhead of Gray	Flooding of agricultural land	3
23	Mause Burn & River Tay	Town centre shops	Flooding of roads possibly linked to tidal effects and storm water overflows	1 *(2)
24	Logie Spout	Industrial Development	Property damage	2
25	Perth Road	Riverside Avenue west of Wright Avenue	Localised flooding of road	3
26	Tay (open)	Fisher Street, Broughty Ferry	Damage to property and flooding or road due to tidal effects	1
27		St Vincent Street, Broughty Ferry underpass below railway line	Flooding of road associated with tidal effects	1
28	Back Burn	St Leonards Road/Cox Street	Flooding on road	2

*() - Figure in brackets refers to flood risk category from previous report.

Flood Risk Category:-

- 1 - Serious damage to property, risk of personal injury, major disruption to services and transportation links.
- 2 - Nominal damage to property, disruption of services and transportation links.
- 3 - Minor inconvenience or little disruption to members of the public.

Figure 1 - Existing Water Courses



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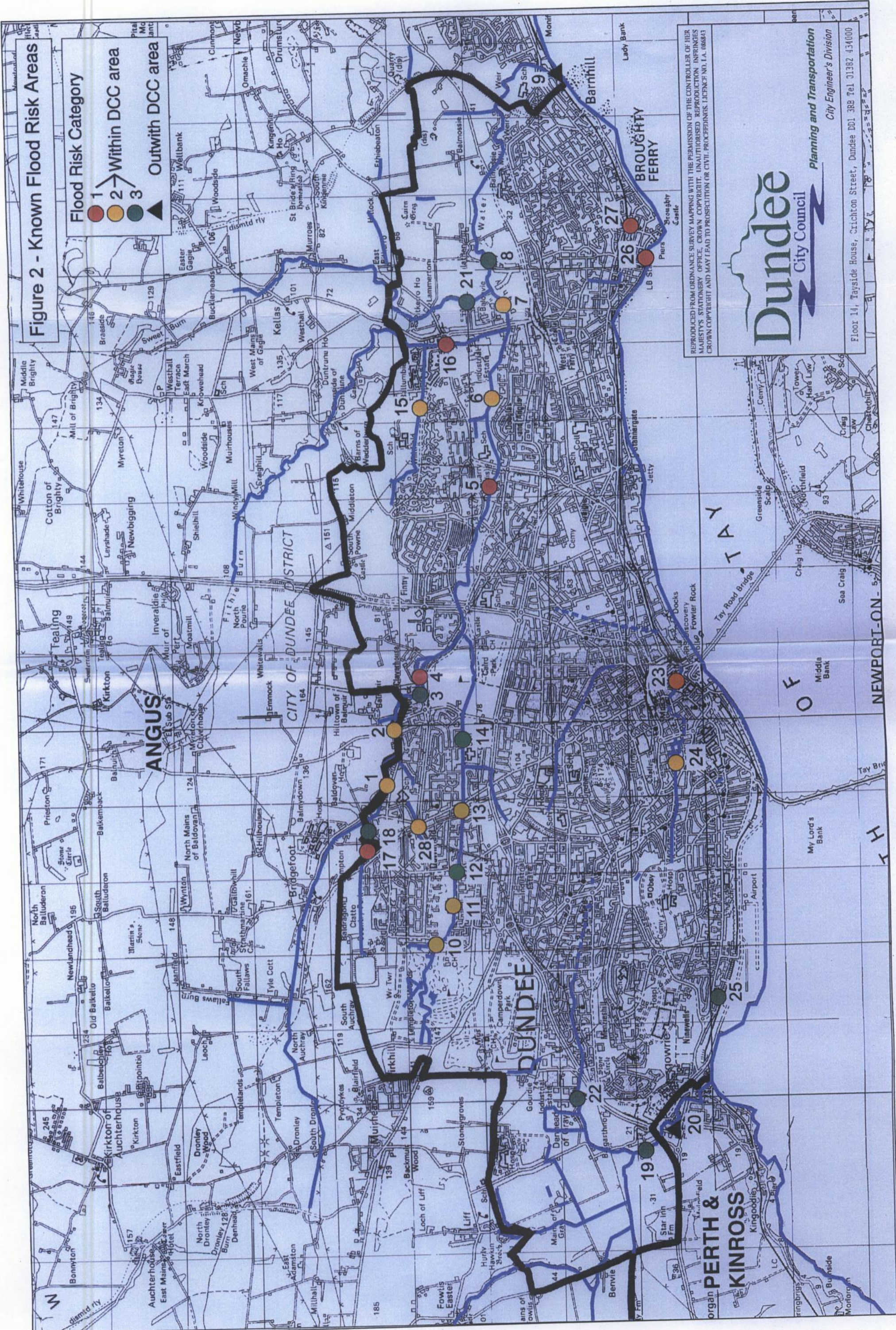
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Figure 2 - Known Flood Risk Areas

Flood Risk Category

- 1 ● Within DCC area
- 2 ● Within DCC area
- 3 ● Within DCC area

Outwith DCC area ▲



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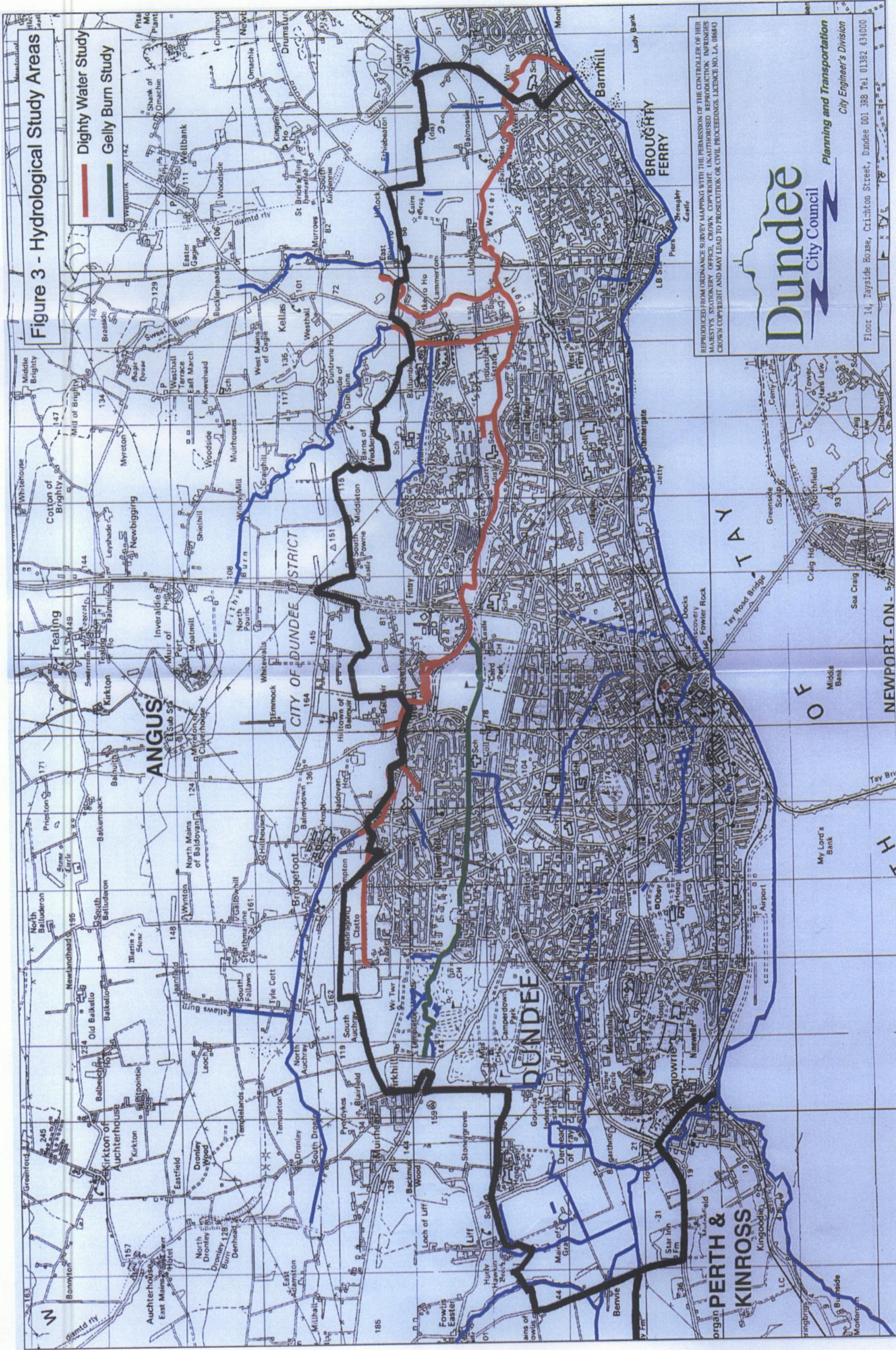
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Figure 3 - Hydrological Study Areas

- Dighty Water Study
- Gelly Burn Study



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