



FLOOD ASSESSMENT

PROPOSED INDUSTRIAL DEVELOPMENT

Lot 132 in DP 31912 81-85 Christie St, St Marys

**Prepared for: N.F. Billyard Pty Ltd.
24 York Rd, Penrith
PENRITH NSW
Telephone: (02) 4731-4589
Facsimile: (02) 4721 3719**

**Submitted by: J. Wyndham Prince Pty. Ltd.
77 Union Rd
PENRITH NSW 2750
Telephone: (02) 4732 3366
Facsimile: (02) 4721 7638**

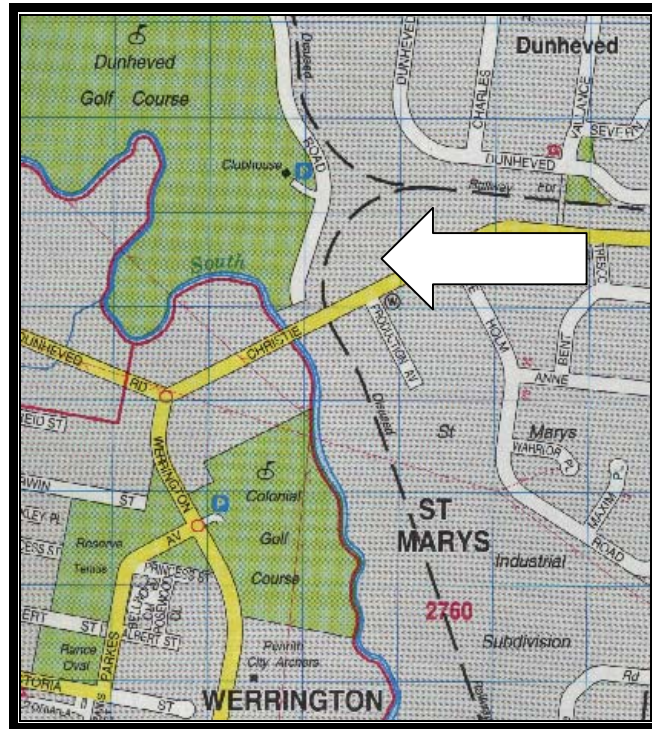
TABLE OF CONTENTS

1.	INTRODUCTION	3
2.	SOUTH CREEK FLOOD HEIGHTS.....	3
3.	EXTREME FLOODS.....	4
4.	SOUTH CREEK FLOODWAY	4
5.	SITE LEVELS.....	5
6.	COUNCIL'S FLOOD POLICY	5
6.1	FILLING OF FLOOD LIABLE LAND	5
6.2	ACCESS TO THE SITE.....	6
7.	IMPACT OF THE PROPOSED DEVELOPMENT	6
7.1	FILLING OF THE ACTIVE FLOODWAY	6
7.2	LOSS OF FLOODWAY STORAGE	6
7.3	COUNCILS FLOOD POLICY CRITERIA.....	7
8.	CONCLUSION	7
9.	REFERENCES.....	7
10.	FIGURES.....	7

1. INTRODUCTION

This report reviews flood management issues for a proposed development to construct a new factory unit at 81-85 Christie Street, St Marys.

Two existing factory units currently occupy the site. The proposed new factory, office space and additional car parking area would be constructed at the rear of the site. Refer to Figure 1.



**Locality Sketch
81-85 Christie Street St Marys**

2. SOUTH CREEK FLOOD HEIGHTS

The site is near South Creek and would, from time to time, be inundated by floodwaters. The most recent available flood study in the area is the “South Creek Floodplain Management Study” by Willing and Partners 1991 (SCFMS). Penrith City Council has issued flood levels for the subject site (Personal Communication - Noel Billyard 13th August 2003):

Location	Q100 Flood Height (AHD)
Christie Street Frontage – Southern End	22.60
Northern End of Site	21.80

The Christie Street flood levels would correlate to Section S1.38 of the SCFMS (immediately upstream of the then proposed Dunheved bridge):

Christie Street Frontage – SCFMS	Flood Height (AHD)
100 year ARI	22.56
50 year ARI	22.23
20 year ARI	21.81

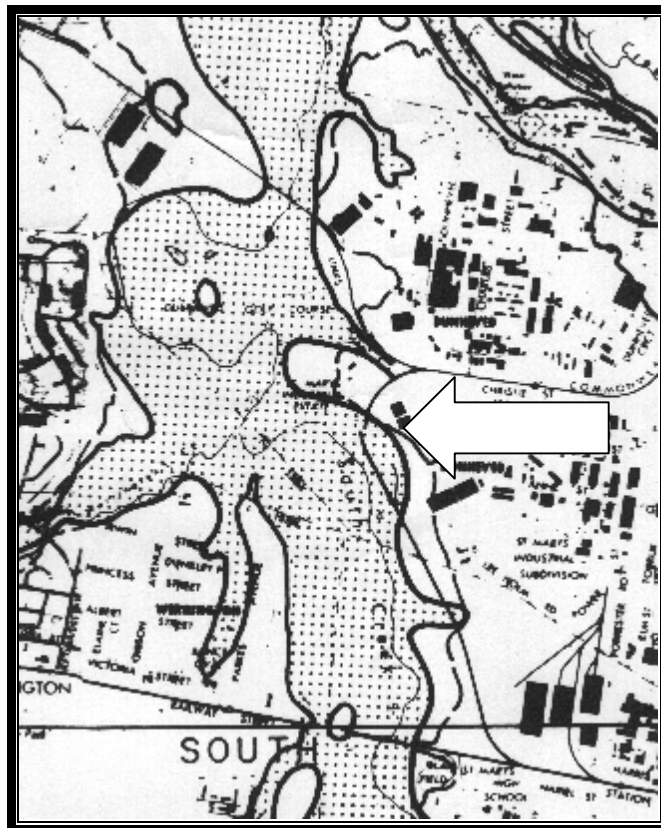
In addition a 100 year flood level at the location of the proposed building was interpolated from those levels provided by Penrith Council to be 22.2 m.

3. EXTREME FLOODS

It should be noted that extreme flood events are significantly higher than the Q100 flood levels. The SCFMS estimated the South Creek Probable Maximum Flood (PMF) to be approximately 3.2 m above the Q100 flood height at Christie Street. The PMF calculated for backwater flooding over the downstream ADI Site from the Hawksbury River is in the order of 6 m above the Q100 flood height.

4. SOUTH CREEK FLOODWAY

The subject site is located near the edge of the Q100 floodway as defined in the SCFMS. However, the broad scale of the SCFMS does not permit a precise delineation of the floodway limit in the immediate vicinity of the site.



**Extract From South Creek Floodplain Management Study
Volume 2 Appendices - February 1991
Map C – Hydraulic Floodway Limits**

Christie Street was extended with a new bridge crossing provided over South Creek in 1992. The SCFMS did not model the impact of this crossing on Flood levels.

A field inspection of the site and the surrounding properties was undertaken and this showed that:

- Christie Street forms a sag point in front of the site with a pipe drainage system directing flows directly to South Creek.
- Water would pond in Christie Street up to approximately RL 21.75 (Depth 0.51 m) before escaping over the sites South Western boundary and draining across the adjacent disused railway site to South Creek.
- The Simsmetal site is located on the southern side of Christie St. opposite the site. This site incorporates a minimum 2 m high earth bund wall located just inside the boundary for the perimeter which effectively would prevent flood waters from South Creek from directly entering Christie Street and the site. That is, while the levels of Christie Street are less than the 100 year ARI flood levels on South Creek at this location, the earth bunding on this site eliminates Christie Street as being an active part of the South Creek floodway. This portion of Christie Street would only be affected by local drainage and/or backflow from pipe systems during the 100 year ARI flood event.
- The site drains generally to the north western side where stormwater overflows generating from the site discharge across the disused railway site on the western boundary to the South Creek Corridor.

5. SITE LEVELS

A survey was undertaken by Freeburn Surveyors of the site. Refer to Figure 1 for the plan showing details and levels. Ground levels in Christie Street are in the order of 21.5 m while existing levels at the rear of the site are about the same or marginally (21.8) higher. The floor levels of the existing factories are 22.05 and 22.36 respectively.

Site levels around the proposed Building range from 21.5 m to 22.06 m with an average level of 21.763 m.

6. COUNCIL'S FLOOD POLICY

6.1 Filling of Flood Liable Land

The site is classified as "Flood Liable" and the requirements of Council's Interim Policy for the Development of Flood Liable Land (Ref. 1) will apply which states that:

".....Council may consider an application to fill flood liable land if the following criteria are met:

- Flood Levels are not increased by more than 0.1m by the proposed filling*
- Downstream velocities are not increased by more than 10% by the proposed filling;*
- Proposed filling does not redistribute flows by more than 15%;*
- The potential for cumulative effects of possible filling proposals in that area are minimal;*

- v. *The development potential of surrounding properties is not adversely affected by the filling proposal;*
- vi. *The flood liability of buildings on surrounding properties is not increased; and*
- vii. *No local drainage flow/runoff problems are created by the filling.*

6.2 Access to the Site

Council's officers have indicated that Council also has a policy with respect to the provision of "flood free access" for developments within or adjoining flood liable land. This requirement usually relates to maintaining a maximum of 250 mm depth of inundation on access points during the 100 year ARI flood.

Flood flows for the Q20 design flood (21.81 m at Christie Street) would present relatively minimal disruption and inconvenience. Trafficable areas would generally be inundated to a level less than 250 mm deep and neither of the existing factories would experience over floor flooding.

While egress from the site is up to 0.95 m deep during the peak of the 100 year ARI flood event, the site is used for commercial purposes so that anyone operating on the site would get ample warning of impending flood (South Creek can be seen from the site) and could readily evacuate. There is a continuously rising means of egress from the site to flood free ground immediately to the east of the site.

7. IMPACT OF THE PROPOSED DEVELOPMENT

The development proposal includes minor filling of the rear of the site to create a building platform for the proposed warehouse building. The building will have a finished floor level of 22.3 m, that is it would be set at a level 0.1 m higher than the interpolated flood level at this location. While Council's policy would allow for the setting of a lower floor level (Section 3.3.5 - Ref. 1), the adoption of a floor level of 22.3 m will allow for a reasonable degree of flexibility as to the operational function of the building and is consistent with the floor level of the building within the site immediately to the south.

The potential impact of this filling was evaluated as part of this investigation.

There are two ways in which floodplain storage issues may affect the hydraulic or hydrological characteristics of the site.

7.1 Filling of the Active Floodway

The first way in which site fill may directly increase flood levels is if the fill reduces the waterway area within active portion of the floodway. This may result in flood level increases and or velocity increases in order to convey the flow through the section.

The site is not part of the active floodway therefore the proposed site fill will have no influence on flood levels or velocities due to loss of active floodway.

7.2 Loss of Floodway Storage

The second mechanism by which the loss of floodplain storage may increase flows and subsequent flood levels is when consideration is given to channel routing effects. The volume of water in a channel especially at low velocities has the effect of attenuating the flows within the channel. A loss of channel or floodplain volume may therefore result in an increase in flood flows.

The magnitude of floodplain displaced by the proposed fill is approximately 930 cu.m. This is determined as the volume between the 100-yr ARI flood level of RL 22.2 m and the site levels within the area of the proposed building platform (Average 21.763 m) prior to filling. (Platform: 38 m wide * 56 m long * 0.437 m average depth = 930 cu.m).

As this potential loss of floodplain storage is a relatively insignificant portion of the total floodplain storage on South Creek at this location, we estimate that the proposed reduction of floodplain storage will have negligible effects on flood flows.

7.3 Councils Flood Policy Criteria

As the site is classified as “flood liable” the requirements of Council’s Interim Flood Policy (Ref. 1) will apply. Specifically, a number of criteria need to be met before Council considers an application to fill flood liable land. These criteria are stated in Section 6.0 above and the following comments can be made with respect to the proposed development and it’s compliance with these criteria:

Criteria	Comment
-----------------	----------------

- | | |
|-------|---|
| (i) | The increase in flood level associated with the proposal is insignificant (i.e. much less than 0.1m) (refer to Section 7.2). |
| (ii) | As the site is not part of an active floodway. There is no velocity increase associated with the proposed site fill works |
| (iii) | Proposed filling does not redistribute flows. The site is not part of an active floodway. |
| (iv) | The potential for cumulative effects of possible filling proposals in the South Creek Floodplain at this location are minimal. Loss of storage on a 100 year ARI flood is negligible. |
| (v) | The development potential of surrounding properties is not affected by the proposal. |
| (vi) | The flood liability on surrounding properties is not increased. |
| (vii) | No site drainage flow/runoff problems are created by the filling. |

8. CONCLUSION

The investigation undertaken as part of the Flood Assessment for Lot 132 in DP 31912 81-85 Christie Street, St. Mary’s has determined that the proposed site fill has negligible impacts on flood flows and flood levels adjacent the development and conforms with Council’s acceptance criteria for filling of flood liable land and site access.

9. REFERENCES

1. **Penrith City Council (1991)** - Council’s Interim Policy for the Development of Flood Liable Land.

10. FIGURES

FIGURE 1 SITE PLAN / PROPOSED BUILDING

