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Dear Belinda

### **Central Interceptor Project - Lyon Avenue Site (AS2): Access Options**

Following the adjournment of the hearing relating to the Central Interceptor Project on 13 August 2013, the Commissioners issued a direction under section 41C of the RMA inviting Watercare to provide further information on the proposed Lyon Avenue site and an alternative suggested by Mr Maddren on behalf of the St Lukes Gardens Apartments (SLGA). This letter report assesses the traffic related issues for the construction site options under consideration and potential mitigation measures of each option which are likely through the detailed Traffic Management Plan (TMP) process. In summary, these options are:

- Watercare's proposed Lyon Avenue site.
- MAGS Alternative 1 – pipe jack option with construction access via Morning Star Place and Mt Albert Grammar School (MAGS); and
- MAGS Alternative 2 – trenched option with construction access via MAGS only.

These options involve construction access via either the SLGA private road (Morning Star Place); or through Mt Albert Grammar School (MAGS) via the Gate 1 driveway entrance on Alberton Avenue (MAGS Gate 1). The assessment set out in this letter addresses the traffic issues associated with construction access via Morning Star Place (Section 1 below) and via MAGS Gate 1 (Section 2 below). Our overall consideration of the traffic issues associated with the three construction options described above is set out in Section 3.

#### **1. Morning Star Place Access**

The Morning Star Place access is the original access design proposed by Watercare for the Lyon Avenue construction site and was assessed as part of the traffic assessment and associated evidence, previously carried out by TDG, including:

- Section 4.3 of the TDG Traffic Report for Central Interceptor project.
- TDG letter to Mr Peter Roan (T&T) dated 11 June 2013 (included as Attachment I of Belinda Petersen's primary statement of evidence).
- Primary evidence of Mr Hills dated 12 July 2013 (paragraphs 5.43 and 5.52).

The following assessment summarises information which has previously been presented in those documents.

## 1.1 Access Description

This access involves a site access to be formed off Morning Star Place (through SLGA site), adjoining the site and opposite the residential complex at 27 Morning Star Place. Site vehicles would travel to and from the site along Morning Star Place via the St Lukes Road / Morningside Drive / Morning Star Place signalised intersection.

Morning Star Place is a private road servicing a number of residential apartment buildings. It runs in a southwest – northeast direction, connecting with St Lukes Road in the northeast and is a cul-de-sac in the southwest. The road is a two-lane, two-way street with perpendicular parking spaces on both sides of the road along the majority of its length (as shown in photograph 1 below) as well as a pedestrian footpath located along its entire length on the eastern side of the road and a partial footpath located on the western side. There are also speed tables and a small roundabout situated on Morning Star Place.



*Photograph 1: Morning Star Place*

## 1.2 Traffic Effects

### 1.2.1 Link to major road network

It is considered that access at this location would provide excellent access to local road network (via traffic signals).

Negligible effects at the St Lukes Road / Morning Star Place signalised intersection (with or without expansion works at Westfield St Lukes) are likely to be caused by the site traffic with approximately nine site vehicles traveling into or out of Morning Star Place during peak hours. The performance of the Morning Star Place leg of the intersection could be further improved by slightly increasing the phase length of this leg of the intersection, particularly in the morning commuter peak period.

### 1.2.2 Pedestrian Safety

Pedestrian access into the Roy Clements Treeway from Morning Star Place would need to be redirected during construction.

Morning Star Place is a low speed environment. The measured average and 85th percentile operating speeds were recorded to be 23km/hr and 27km/hr respectively.



This slow speed is due in part to signage (10km/hr posted speed limit) and the presence of four raised speed tables. We would expect any TMP developed for this site to emphasise and enforce truck drivers travelling at an appropriate speed.

While pedestrian footpaths exist on both sides on Morning Star Place (non-continuous on the western side) it is noted that a number of pedestrians do walk on the carriageway. At the same time, on-site observations show that these pedestrians do move out of the carriageway when vehicles approach. The low speed nature of the area allows this to occur safely. The construction trucks are likely to be even more noticeable to pedestrians which will give ample time for the pedestrians to move out of the carriageway.

Further, we note that the St Lukes Gardens Apartments were developed in stages with many of the apartment buildings being constructed while other buildings were occupied. As such, Morning Star Place has experienced significant levels of construction vehicle activity in the past while some apartments were occupied. A search of the New Zealand Transport Agency's Crash Analysis System shows no reported accidents on Morning Star Place (which is included in the database even though it is a private road) over the last 10 years.

### 1.2.3 Vehicle safety / capacity

Given the low speed nature of Morning Star Place, due to the presence of speed tables and the geometry of the street, it is considered that there is adequate sight distance in both directions, at the proposed access.

Morning Star Place carries in the order of 1,100 to 1,600 vehicles per day. Traffic surveys I have undertaken show peak hours to be up to 113 vehicles per hour with traffic volumes being relatively constant throughout the day. Typically, Local Roads carry less than 1,000 vehicles per day (although many do carry more). As such, the traffic on Morning Star Place is already higher than typically experienced on Local Roads. The additional traffic generated by the Project will add between 6 - 9% in the peak hour and 4 - 6% on a daily basis. While over half this additional traffic will be single unit trucks, it does demonstrate the actual increase will be minimal.

Morning Star Place is already served by rubbish trucks on a regular basis and the largest designed vehicle proposed to access the site would be of similar size to the trucks already using Morning Star Place (single unit dump trucks). Furthermore, only five heavy vehicles are expected to travel to or from the site per hour. The probability of two trucks requiring to pass each other would be low, however, Morning Star Place is of sufficient width for two trucks to pass each other. We have measured the actual remaining width on Morning Star Place (between two parked cars on either side of the road) and found the minimum on-site dimension to be approximately 7.2m. This is considered ample width for two single unit trucks to pass each other.

It is noted that a small number of larger articulated trucks may also visit the site. This will be a rare event and only potentially relating to precast / steel delivery and can be managed to not occur at the same time as any other truck movements, and would likely only occur for short durations to match the construction scheduling. The size of this articulated truck will be limited to the site itself and the ability to turn the truck around on-site. Accordingly, we do not consider the largest semi-trailer permitted in New Zealand (19m long) will be able to access the site as it will simply be unable to turn around on-site. Rather, we would expect the semi-trailer / articulated truck to be smaller at approximately 13.5m long with 11m long flat-decks.



Of note, an entering semi-trailer can pass another semi-trailer (or any other vehicle) over the entire length of Morning Star Place except for the final 50m closest to the construction access. Given the low numbers of such trucks expected, (approximately 20 in total for the entire project) this cross-over can easily be safely accommodated by an on-site spotter as part of the final detailed TMP for this site.

#### 1.2.4 Parking effects

The visitor car park at 27 Morning Star Place of 22 spaces would be removed during construction as it will be part of the overall works area. This removal would be required regardless of where access is from as it is needed for construction activity. The Resource Consent for the Morning Star Apartments development was approved with acknowledgments of the potential loss of these parking spaces during the construction of the Central Interceptor Project. The private parking spaces east of the visitor car park on Morning Star Place (or any other car parks) would not be affected by the works.

### 1.3 Mitigation Measures

The residential nature of Morning Star Place means construction traffic would need to travel adjacent to residential housing and moderate levels of pedestrians. A TMP would therefore be required. The mitigation measures within the TMP are likely to include:

- Additional traffic calming devices at the vehicle crossing point to the construction site as well as truck speed restrictions along Morning Star Place to reinforce the existing internal speed limit and to thus make sure trucks travel at appropriate speeds.
- Fencing or barriers required to separate footpaths from the subject site around the vehicle crossing point into the construction site.
- Contractor parking associated with the construction works not permitted on Morning Star Place nor within any of the private parking areas accessed from Morning Star Place.
- Access for emergency vehicles (including fire trucks, ambulance) and service vehicles (including rubbish trucks) along Morning Star Place will need to be maintained at all times.
- A suitably qualified traffic controller will need to be available during construction works along the section of Morning Star Place that does not have footpaths on both sides of the road, to accompany pedestrians along the road to a footpath or their parked car, (as appropriate).
- Public access will need to be maintained between Morning Star Place and the Roy Clements Treeway pedestrian walkway.

### 1.4 Overall Assessment

It is considered that this construction access via Morning Star Place is a good option from a traffic engineering point of view, providing the above mitigation measures are implemented. The access enables excellent access onto the road network by means of a signalised intersection and is considered satisfactory with respect to traffic safety.

In terms of the effect to local residents, they are likely to experience a small increase in waiting time at St Lukes Road / Morning Star Place due to the increase in traffic, no loss in road use (two-way road will be unchanged) and a slight potential reduction in road safety due to the presence of construction trucks which will however, be controlled / mitigated by speed limit enforcement, additional traffic calming and a traffic controller (as required).

## 2. MAGS Gate 1 Access

TDG has previously assessed alternative construction access options for the proposed Lyon Avenue site (refer letter from TDG to Mr Peter Roan dated 11 June 2013 in Attachment I of Belinda Petersen’s primary statement of evidence as well as Evidence in reply of Mr Hills dated 13 August 2013 (paragraphs 3.9-3.12) and primary Evidence of Mr Hills dated 12 July 2013 paragraphs 5.49-5.51). This included an assessment of construction access via MAGS. The following assessment incorporates that previous information, and provides further information on the potential traffic effects of the MAGS Alternatives now being assessed.

### 2.1 Access Description

This option involves a site access from the existing Gate 1 access to MAGS on Alberton Avenue, and along the northern edge of the sport fields to the construction site. This access is currently used to gain access to the MAGS hostel as well as maintenance and general access to the MAGS sports fields, including the rear of the sports pavilion.

The access route would be an extension (and widening) of the existing school maintenance track and would also be formed over the green fields of the school (near the existing cricket nets) via the existing maintenance track that travels past the MAGS hostel. As a new vehicle bridge across Meola Creek would also be required for the MAGS Alternative 2-trenched option.



**Photograph 2: likely access location**

Alberton Avenue is a two-way two-lane road with on-street parking permitted on both sides of the road. It is classified as a “local road” in the District Plan. It mainly provides access to residential properties and also provides vehicular access to MAGS, Marist College and Mt Albert Aquatic Centre. Alberton Avenue forms a give-way priority intersection with Mt Albert Road in the south and a stop priority intersection with New North Road in the north. Speed humps are situated along the length of Alberton Avenue.

## 2.2 Traffic Effects

### 2.2.1 Link to major road network

Sight distance at the existing Alberton Avenue driveway to Gate 1 access MAGS is appropriate for heavy vehicles. However given the volumes on Alberton Avenue (4,900 vpd in 2009 which is considered high for a local road) and the Alberton Avenue Gate 1 driveway is only priority controlled, only left turns would likely be permitted for heavy construction vehicles at the driveway. This restriction would restrict truck movements and route choice for the trucks.

The route choice is further restricted as each end of Alberton Avenue (New North Road and Mt Albert Road) is also priority controlled. Given these two roads are major arterials, left turn only truck restrictions would also apply. As such, overall the link to the major road network (arterials) is somewhat limited with this access.

### 2.2.2 Pedestrian Safety

The MAGS option would require a long narrow access route through the school, raising moderate potential for pedestrian / vehicle conflict near the School hostel and students using the school fields.

There is potential for conflict between the truck access and school student / boarders near the vehicles entrance to Alberton Avenue and on the construction access road itself, particularly immediately before and after school times. Ideally fencing would be provided to separate the entire truck access and the school users. Given however that school cars also use the access on Alberton Avenue (access to parking for hostel), and the need to maintain access for emergency vehicles, it is unlikely the trucks could be fully separated from school users near Alberton Avenue.

This would be exacerbated by the lack of footpaths / defined pedestrian areas in this area. This area is shown in Photograph 3 below:



**Photograph 3: MAGS Alberton Avenue access**

Consequently, pedestrian safety would be compromised if this access route were to be formed and additional mitigation would be required (eg dedicated footpaths along the access / alternative pedestrian routes).



### 2.2.3 Vehicle safety / capacity

Alberton Avenue has a low speed nature due to the presence of speed humps and the geometry of the street. Adequate sight distances are available in both directions from the proposed access via Gate 1.

If the MAGS Alternative 2-trenched option was considered, site vehicles would need to cross Meola Creek to gain access to the site works on the right bank of the stream. A new bridge would be required to provide this access.

As seen in the Photograph 3 above, the majority of the existing MAGS access is one-way in width but caters for two-way traffic (vehicles travelling in both directions). Given the increase in traffic volumes (especially heavy vehicles), conflict with existing school users (including maintenance vehicles and sports pavilion) and limited sight distance along the access route, the access should ideally be widened to accommodate two-way traffic and pedestrian access to the MAGS hostel. However it is recognised that providing the width needed for two-way traffic may be difficult/ impossible in places due to trees / retaining / proximity to stream bank. In these locations (likely one or two locations near the hostel) it is likely that additional traffic controls (eg: temporary traffic signals) will be required.

### 2.2.4 Parking effects

As previously noted, the 22 visitor spaces at 27 Morning Star Place would be removed due to physical works at the Lyon Avenue Spillway.

The construction access via MAGS will conflict with access to the parking spaces associated with the School hostel. If detailed design / mitigation shows that access can be shared between construction vehicles and existing users (with appropriate pedestrian footpaths), then no additional loss in parking would occur. However, if the detailed design / mitigation measures shows that due to safety concerns the construction access will need to be fully separated from the School site (especially near the MAGS hostel) then it is likely that alternative parking will be required for in the order of six vehicles.

## 2.3 **Mitigation Measures**

Using the MAGS Gate 1 access off Alberton Avenue means construction traffic would need to travel past residential housing / student areas, including potentially high numbers of school users/pedestrians. A TMP would therefore be required. The mitigation measures within the TMP are likely to include:

- Restrictions on truck access would likely be needed during the school peak between 8:00am and 9:00am, and 2:30pm to 3:30pm to make this option feasible.
- Within the school grounds, careful traffic management would be required including fencing between the site and school users and providing designated walking paths to the hostel outside of truck paths.
- Ideally the access track should be widened to accommodate a two-way access road. In any sections where this cannot be achieved (eg: due to trees/ retaining/pedestrian paths), additional traffic management will be required (eg: traffic signals), so that a one-way system can operate safely and efficiently.
- Access to / from Alberton Avenue would be restricted to left in / left out.
- Left turn only movements permitted at each end of Alberton Avenue (Mt Albert Road and New North Road).



- Access to School facilities including hostel (both pedestrian and parking) will need to be maintained at all times (or alternatives found including alternative parking if this is not possible).
- Speed restrictions would be required on the access past the School hostel.
- Access for emergency vehicles (including fire trucks, ambulances) along the School access route would need to be maintained at all times.

## 2.4 Overall Assessment

This MAGS option is considered feasible from a traffic engineering point of view subject to the above construction mitigation measures. However, the option is not preferred from a traffic engineering perspective compared to access via Morning Star Place. This is due to the option having inferior linkages to the major road network (additional turning restrictions), inferior access to the site (likely one-way sections) and potential conflict between construction vehicles and school traffic/children.

## 3. Consideration of proposed construction site options

We understand that three options are being reviewed relating to the site, being:

- (i) Watercare's proposed Lyon Avenue site – with construction access via Morning Star Place
- (ii) MAGS Alternative 1 – pipe jack option with construction access via Morning Star Place and MAGS; and
- (iii) MAGS Alternative 2-trenched option with construction access via MAGS only.

These options are shown in Drawing Numbers AEE-MAIN-3.2, LYON-SK1001\_B and LYON SK1101\_B attached to Watercare's response to the Commissioners.

Our traffic assessment of Watercare's proposed Lyon Avenue site is set out in Section 1 above. Overall, we consider construction access via Morning Star Place is a good option from a traffic engineering point of view, providing the above mitigation measures are implemented, as the effects can be appropriately avoided or mitigated.

Our traffic assessment of Alternative 1 requires consideration of traffic effects on both Morning Star Place and in the MAGS grounds and Alberton Avenue. In this regard, we understand that the scale of works required adjacent the Lyon Avenue Spillway and in the MAGS sports fields will be similar, however, occupation at the MAGS site will be for a longer duration. The mitigation provisions identified in both Section 1 and 2 above would be required for Alternative 1; however the duration and quantity of traffic movements on Morning Star Place will be less than for Watercare's proposed Lyon Avenue site. Overall, Alternative 1 results in traffic effects at two locations and, other than reducing the number and duration of traffic movements on Morning Star Place, does not appear to offer benefits that would outweigh Watercare's proposed Lyon Avenue site.

Our traffic assessment of Alternative 2 is set out in Section 2. Overall, our assessment is that access via MAGS Gate 1 is not preferred from a traffic engineering perspective compared to access via Morning Star Place due to the option having inferior links to the major road network (additional turning restrictions), inferior access to the site (likely one-way sections) and potential conflict between construction vehicles and school children. However, with the mitigation measures proposed for this option, including restricting truck hours, traffic signals, additional footpaths/fencing and potential relocation of parking spaces, it could be made viable.



## 4. Summary

The following table summarises the results of our analysis of traffic issues associated with construction access via either Morning Star Place or MAGS Gate 1.

OPTION	Traffic Issues			
	Link to major road network	Pedestrian safety	Vehicle safety / capacity	Parking effects
1. Watercare's Lyon Ave option: access via Morning Star Place	<b>Excellent</b> , via signalised intersection to major arterial road	<b>Good</b> , a number of resident pedestrians but separate footpaths provided. A traffic controller be available to improve safety to residents as required Management of trucks speeds would be required.	<b>Excellent</b> . Two-way road, good sight distance.	No additional loss above the 22 visitor spaces which are lost for all construction site options due to work area.
2. MAGS Alternative 1: Access via Morning Star Place AND MAGS	<b>Acceptable</b> , access from MAGS site restricted to left turns as well as intersection with arterial roads at either end of Alberton Avenue. Access via Lyon Avenue via signalised intersection.	<b>Good</b> , providing fencing/footpath is provided to separate the construction access from pedestrians near MAGS hostel, and speed restrictions are put in place. Traffic controller and speed restrictions required on Morning Star Place.	<b>Good</b> . Separation of site traffic from school traffic for MAGS access required in confined area, eg: signage/fencing. Access likely to be restricted to one-way in places with signals required. Morning Star Place provides two-way road.	No additional loss providing access maintained to hostel in MAGS. If separation of the access road by fencing is required (which also restricts access to cars associated with the hostel) then alternative parking would be required
3. MAGS Alternative 2: Access via MAGS	<b>Acceptable</b> , access restricted to left turns as well as intersection with arterial roads at either end of Alberton Avenue	<b>Good</b> , providing fencing/footpath is provided to separate the construction access from pedestrians especially near MAGS hostel, and speed restrictions are put in place.	<b>Good</b> . Separation of site traffic from school traffic required in confined area, eg: signage/fencing. Access likely to be restricted to one-way with signals required.	No additional loss, providing access maintained to hostel. If separation of the access road by fencing is required (which also restricts access to cars associated with the hostel) then alternative parking would be required

Overall, we consider all of the construction site options are viable; however, our assessment is that Watercare's proposed Lyon Avenue site and access via Morning Star Place is the best access option from an overall traffic engineering perspective. In terms of permanent access post construction, either Morning Star Place or MAGS options are acceptable from a traffic engineer perspective, as traffic volumes associated with routine maintenance will be low, and safe access/egress to the wider public road network can be provided for both options.

If you require any further clarification please do not hesitate in contacting us.

Yours sincerely  
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