2. Description of the action

2.1 Scope of works

2.1.1 The proposal

It is proposed to construct a new four lane bridge over the Sydney to Melbourne Rail Line (the new bridge) between Sydney and Melbourne. The proposal would include realigning about 2.7 kilometres of the Olympic Highway. The proposal would also include upgrading the Olympic Highway/Camp Access Road intersection. An overview of the proposal is shown in Figure 1.2.

Key features of the proposal would include:

- Construction of a new four-lane road-over-rail bridge on the Olympic Highway. The new bridge would span the Sydney to Melbourne Rail Line about 460 metres north of the existing bridge. It would have three spans. It would be 21 metres wide and 99 metres in length. The bridge would provide a minimum clearance of 7.1 metres above the rail line.
- Construction of about two kilometres of realigned Olympic Highway south of the proposed bridge. This would realign the Olympic Highway to the east of the existing highway.
- Construction of about 700 metres of realigned Olympic Highway between the proposed bridge and the northern extent of the proposal. This realigned section of the Olympic Highway would be immediately west of the existing highway for about 300 metres north of the proposed bridge before matching the existing alignment for about 400 metres.
- Construction of an upgraded Olympic Highway/Camp Access Road intersection.
- Realignment of Camp Access Road at the new Olympic Highway intersection.
- Joining the new road with the existing Olympic Highway at the southern and northern extents of the proposal.
- Joining the new road with the existing Camp Access Road.
- Construction of about 560 metres of off-road shared bicycle and pedestrian pathway crossing the proposed bridge. The shared pathway would connect the Wiradjuri Walking Track to Camp Access Road.
- Construction of a temporary road east of the existing Olympic Highway for about 400 metres north of the proposed bridge.
- A large cutting about 18 metres deep, 180 metres wide and 400 metres long south of the proposed bridge.
- Construction of two large earthen embankment approaches to the bridge, including two major reinforced earth retaining wall structures.
- Establishment of sediment control basins, drainage controls, boundary fencing and traffic controls.
- Modification of existing property accesses and access roads.
- Construction of two hard stand areas for crane and piling activities adjacent to the new bridge.
- Relocation and protection of public utilities.
- Establishment of construction compounds and provision of access to the site.

- Construction of highway crossings (rope bridges) for Squirrel Gliders to maintain connectivity.
- Landscaping of areas disturbed by construction and plantings for biodiversity impact mitigation.
- Installation of a temporary automatic weather station. The station would gather weather condition data to be used in construction management. The weather station would have an area of 15 metres by 15 metres. It would be removed at the end of works.

There would be no works associated with the existing road-over-rail bridge as part of the proposal.

Temporary site compounds would be located at each of the following sites (see Figure 1.2):

- At the proposed main site compound on agricultural land south of the decommissioned fuel depot.
- North of the existing bridge (smaller temporary bridge site compound).
- In the stockpile site proposed in the north of the proposal on land owned by the NSW Soil Conservation Service.
- In the stockpile site proposed west of Camp Access Road.
- In the stockpile site proposed east of and adjacent to the existing Olympic Highway at the southern end of the proposal.

The proposal includes five sediment basins. The two sediment basins at the southern end of the project would be temporary with the remaining three basins being permanent structures.

The proposal would be completed in four stages as described in section 3.3.1 of the review of environmental factors (GHD 2013a). The staged construction would enable continued operation of the Olympic Highway and Camp Access Road during the construction period.

It is anticipated that construction would occur over a period of 18 months.

A full description of the major design features of the proposal is provided in section 3.2.3 of the review of environmental factors (GHD 2013a). This describes the road-over-rail bridge, Olympic Highway realignment, cut and fill design, Olympic Highway/Camp Access Road intersection and shared bicycle and pedestrian pathway.

2.2 Construction methods

2.2.1 Construction activities

Pre-construction activities

- Collect seed from tree species locally native to the study area before construction commencing.
- Adjust utilities as required (see *public utility adjustment* section below).
- Install permanent boundary fencing.
- Install the automatic weather station.
- Establish the temporary construction compound site(s) (see locations in Figure 1.2).
- Install temporary fencing to prevent access to dangerous areas (for example the proposed blasting site where heavy cut would occur between chainages 68850 and 69270).

- Install permanent and temporary fencing to prevent access to environmentally sensitive areas (for example Silvalite Reserve) where necessary.
- Progressively install temporary and permanent erosion, sedimentation and drainage controls.
- Establish stockpile sites at the main compound site and in designated areas (see locations in Figure 1.2).
- Provide noise attenuation measures, including architectural building treatments.

Construction activities

- Clear and grub vegetation.
- Progressively strip, stockpile and manage topsoil across the site.
- Adjust private property access for the two private properties at the northern end of the proposal and the private property at the southern end to allow for safe access throughout construction.
- Construct cross-roadway culverts used for clean water diversion.
- Construct the road formation using bulk earthworks. This this would include winning, transporting, placing and compacting fill material in defined lots and layers.
- Hard rock-blasting in the section of cut between chainages 68850 and 69270, and crushing and processing of excavated rock.
- Construct bridge piles.
- Construct retaining walls and bridge abutments.
- Construct bridge piers and head stocks.
- Install concrete bridge girders and pour concrete bridge deck. Pre-cast concrete bridge girders would be transported to site and lifted into place by crane. The bridge deck would be formed up on top of the girders, steel tied in place and concrete poured to form the deck.
- Import gravel materials, compact and prepare the final road surface.
- Recycle suitable excavated material and incorporate unsuitable material in earthworks.
- Construct the roadside batters to the final shape.
- Construct roadside gutters and berms.
- Install flexible asphalt pavement.
- Install poles and/or overhead rope crossings for Squirrel Gliders to move across the highway.
- Progressively landscape and re-vegetate the proposal.
- Install line marking, signs and guide posts.
- Block access to the existing bridge using fences and gates or earth mounds.
- Decommission and remove redundant road pavement.
- Clean up the site including removal of temporary site compound(s) and dispose of all surplus waste materials.

2.2.2 Earthworks

Earthworks would occur over an area of about 20 hectares. Where possible, the proposal has been designed to achieve an overall balance of earthworks to minimise spoil and or the need to import large quantities of fill.

It is estimated that about 310,000 cubic metres of material would be excavated from cut areas within the proposed road alignments.

The maximum depth of cut would be 18 metres. The maximum width of cuttings would be about 180 metres.

The volume of material excavated that would be suitable for use as general fill is estimated to be about 90 per cent of the total volume of material excavated. It is therefore estimated that of the material excavated, 279,000 cubic metres would be suitable for use as fill and 31,000 cubic metres would be unsuitable for use as fill.

Material suitable for use as general fill would be reused on site for the construction of new roads. The total volume of fill material required for constructing new roads is 232,000 cubic metres.

The maximum width of fill embankments would be about 50 metres. The maximum height of fill would be nine metres.

It is therefore anticipated that 78,000 cubic metres of surplus material would be excavated from the proposal. Surplus material, including material unsuitable for use as fill, may be used for flattening fill batters, constructing noise mounds or in landscaping. Any material remaining after construction would be disposed of off-site at an appropriately licensed or approved facility.

Blasting would be required where hard rock is encountered in a section of cut. Blasting would be conducted using pre-drilled sequential explosive charges to break up the hard rock in the deepest part of the cut. It would be supervised by licensed blasting technicians and would be designed to minimise vibration impacts on surrounding infrastructure. Hard rock from blasting may need to be further processed through crushing and screening.

The relocation of the water pipeline and gas pipelines would require the excavation of about 5,550 cubic metres of soil. Most of this would be used to backfill the trenches after installation of the pipes.

2.2.3 Construction access management

Proposed construction access roads are shown in Figure 1.2.

Access to the proposal for all works would be via the Olympic Highway and Camp Access Road. The main access points for construction vehicles would be located at:

- The site compound south of the proposed bridge, which would be the primary access point to the work site.
- The temporary road north of the proposed bridge, which would be used for access to the proposed bridge site following the switch of traffic to the new Camp Access Road alignment.
- The access track from the existing highway east of the existing bridge.
- The existing quarry access road south of the proposed stockpile site at the southern end of the proposal. This is an unnamed council-owned road.
- The existing access track west of, and parallel to, Camp Access Road, which would be used to access the proposed stockpile site west of Camp Access Road. This access route would require the use of part of Camp Access Road.

- The proposed stockpile site at the far northern end of the proposal.

All of these follow existing tracks or roads, except the access point for the stockpile site at the far northern end of the proposal. This access point would require the construction of a 30 metre access road through the existing highway road reserve.

Other access points may be required. This would be determined during the detailed design of the proposal. All construction access roads would be included in the traffic management plan.

Construction access would also be provided along the proposed alignment.

2.2.4 Plant and equipment

Plant and equipment

Plant and equipment needed for the proposal would be determined during the construction planning phase. It is anticipated that the required plant and equipment would include:

General

- Excavators.
- Bulldozers.
- Graders.
- Water carts.
- Semi-trailers and large delivery trucks.
- Air compressors.
- Light vehicles.
- Generators.
- Water pumps.
- Hand tools.
- Welding equipment.
- Haulage trucks.
- Backhoes.
- Front-end loader.
- Bobcats.
- Jackhammers.

Road embankment and drainage construction

- Scrapers.
- Graders.
- Vibrating and static rollers.
- Crushers.
- Articulated trucks.
- Backhoes.
- Trenching machines.
- Excavators.
- Screens.

Road pavement construction

- Milling machine.
- Compactor.
- Vibrating and static rollers.
- Concrete agitator trucks.
- Spray sealing equipment.
- Line marking plant.
- Bitumen spraying cart and asphalt paver.
- Bitumen trucks.
- Kerb extruding machine.

Bridge

- Piling rigs.
- Concrete vibrators.

- Concrete pumps.
- Cranes.
- Trucks.
- Concrete drills.
- Concrete saws.
- Concrete trucks.

2.2.5 Construction materials

Fill, sub-base and base materials and aggregates for bitumen sealing and concrete works would consist of:

- Soil.
- Gravel and sand.
- Crushed and screened rock.

Imported material that would be required for the proposal is commercially available. All imported material would be sourced from licensed commercial quarries.

The quantities of these materials required for the proposal are estimated to be:

- Sub-base – about 10,600 cubic metres.
- Base – about 11,200 cubic metres.
- Select materials – about 19,000 cubic metres. These materials may be sourced from excavation on site depending on quality. Select materials have specific size and moisture characteristics and are of a high grade for use in construction activities. Select materials would be used to form a high quality base for the construction of the road pavement layers.
- Specialised material for the reinforced soil wall – about 11,600 cubic metres.
- Spray seal – about 49,000 square metres.
- Asphalt – up to about 200 cubic metres for the bridge sealed surface.

These volumes are indicative and may change as a result of the detailed design.

Steel and pre-cast concrete structures would be required for the bridge. Concrete would be required for the bridge deck and piers. Pre-cast bridge elements would be procured from certified suppliers. Concrete would be sourced locally.

Road drainage structures would either be pre-fabricated offsite at an approved and licensed facility, or would be constructed on-site (for example energy dissipaters, pit modifications and kerb and gutter).

Water would be required during construction to achieve required earthworks moisture content, and to suppress dust. The construction contractor may source water from existing farm dams or sediment ponds constructed as part of the proposal. The volume of water required would be influenced by climatic conditions, and the level of moisture in excavated rock, which would be used to construct the new highway. The volume of water required for the proposal is not expected to exceed 15 megalitres. If sufficient water cannot be obtained from dams and sediment ponds it may be sourced from Riverina Water County Council water supply mains in the area or another alternative water source. This would be subject to further environmental assessment and approvals.

2.2.6 Ancillary facilities

Site compounds

Proposed temporary site compounds are shown in Figure 1.2. These include:

- The proposed main site compound on agricultural land south of the decommissioned fuel depot. This land is privately owned and would be part of the land acquired for the proposal.
- North of the existing bridge (smaller bridge site compound). The site would be located close to the proposed bridge to service construction activities.
- Within the stockpile site proposed in the north of the proposal on land owned by the NSW Soil Conservation Service, west of the existing Olympic Highway.
- Within the stockpile site proposed west of Camp Access Road on agricultural land owned by the Commonwealth Department of Defence.
- Within the stockpile site proposed east of and adjacent to the existing Olympic Highway at the southern end of the proposal, on agricultural land.

In general, the main facilities at the site compounds would include portable buildings with meeting rooms, offices, lunch rooms and toilet facilities. The compounds would also contain secure bunded areas for the storage of fuels and chemicals, and designated parking and waste management areas.

A secondary temporary compound for bridge works would include site office buildings, toilets, and storage areas for equipment and materials used during the bridge works.

Stockpile sites

Proposed stockpile sites are shown in Figure 1.2.

Stockpile sites would be temporary for the period of construction and would be rehabilitated before the completion of construction. These areas would generally be leased from adjacent property owners for the period of construction.

The stockpile sites would include:

- A site at the southern end of the proposal on land currently used for cropping and grazing.
- A site west of the existing Camp Access Road on land currently used for cropping and grazing. The land is owned by the Commonwealth Department of Defence.
- A site west of the existing Olympic Highway currently used for cropping and grazing.
- Five smaller sites located along the proposed highway realignment.

The stockpile sites would be subject to the criteria set out in RMS's Stockpile Site Management Guideline (RTA 2011a):

- Located in areas not prone to flash flooding (ie drainage line in Silvalite Reserve north of the proposal) and more than 40 metres from a watercourse.
- Located more than 100 metres from occupied residences.
- Located in areas previously disturbed that do not require the clearing of native vegetation where possible.
- Located in plain view of the public to deter theft and illegal dumping.
- Stockpiles would be located outside the drip line of trees and would be on level ground wherever possible.

Sediment basins and drainage

Proposed sediment basins and drainage are shown in Figure 1.2.

Five sediment basins are proposed to be constructed. One of these is located in Silvalite Reserve, one is located near the site of the proposed bridge and three are located at the southern end of the proposal in the vicinity of the proposed temporary site compound.

The southern two basins would be temporary basins for use during construction. The remaining three would be retained as permanent sediment basins after construction.

The sediment basins would capture runoff from disturbed areas. The captured runoff would be treated to settle suspended silt. Clean water from the basin would then be discharged. This process would minimise the discharge of sediment off site or to adjacent drainage lines. Sediment basins would also reduce flow velocities and potential scouring.

Clean water from upstream of the proposal would be diverted around, away from, or through the proposal. The sediment basins would only contain runoff generated from the proposal.

The sediment basins have been designed based on the volumes calculated for sediment control using the '*Blue Book - Soils and Construction - Managing Urban Stormwater Volume 1*' (Landcom 2004) and Volume 2D (DECC 2008a). The design standard for sediment basins adopted for the proposal is the five-day 80th percentile rain depth of 18.8 millimetres (Wagga Wagga, from Landcom 2004). Sediment basins would capture all runoff from a rainfall event of this magnitude. The sediment basins have also been designed to capture any spills of fuels or chemicals that could potentially occur during construction.

Sediment basins would be designed for dispersible soils. If discharge from these basins is necessary, flocculating (removal of sediment from water) may be necessary to achieve adequate discharge water quality.

Permanent and temporary drainage would:

- Drain clean water around, away from, or through the proposal.
- Drain most dirty water generated on-site to sediment basins.

Most surface water flows would be diverted around the decommissioned fuel depot.

Due to site constraints at the northern 280 metres of the proposal and southern 220 metres of the proposal, dirty water runoff cannot be captured using sediment basins. This runoff would occur from a likely total area of about 1.2 hectares. Minimal earthworks are required at these locations due to construction works following the existing alignment. Strategies detailed in Blue Book Volume 1 (Landcom 2004) would be implemented. Dirty water runoff would be managed using clean and dirty water separation, progressive revegetation, soil stabilisers and sediment controls.

The proposed drainage has been designed to direct water away from existing soil erosion where possible.

2.2.7 Public utility adjustment

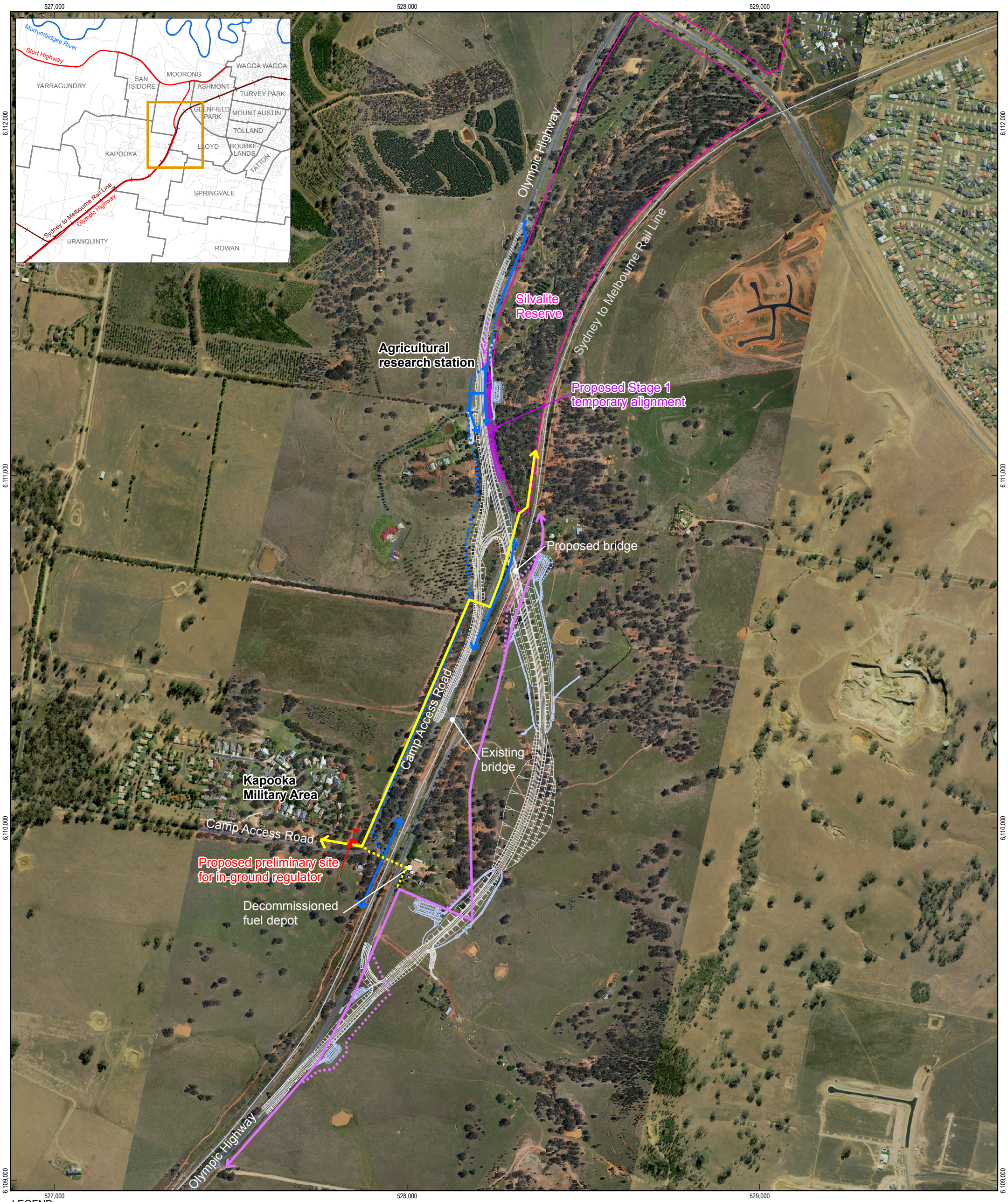
Existing utilities in the vicinity of the proposal to be adjusted or protected include:

- High and low pressure gas pipelines managed by APA Group, including the Australian Pipeline Trust.
- Fibre optic cable and minor telephone lines managed by Telstra.
- Water pipeline managed by Riverina Water County Council.
- 11 kilovolt and low voltage power lines managed by Essential Energy.
- Rail signalling managed by Australian Rail Track Corporation.

Roads and Maritime has conducted initial consultation with all utility providers regarding the relocation and protection of utilities for the proposal. Relocation and protection of utilities would be designed by the service providers during the detailed design phase. Proposed realignments of utilities are shown in Figure 2.1. The utility owners affected by the proposal area would determine the work methodology for the relocation or protection of their assets. Relocation and protection of utilities would be carried out by the service providers before construction.

2.2.8 Commonwealth land to be leased

The proposal requires about 3.04 hectares of land to be leased from Lot 1 DP 554820, which is owned the Commonwealth Department of Defence. The land would be leased for a stockpile/compound site as shown in Figure 1.2. Lease areas would be required for the period of construction only.



LEGEND

- Proposed preliminary site for in-ground regulator
- Existing water main
- Proposed new water main
- Existing low pressure gas pipeline
- Proposed new low pressure gas pipeline
- Existing high pressure gas pipeline
- Proposed new high pressure gas pipeline
- Proposed road
- Proposed Stage 1 temporary alignment
- Proposed drainage and sediment detention basins
- Railway line
- Silvalite Reserve

Note: Figure only shows utilities in the vicinity of the proposal. The full extent of utilities in the mapped area is not shown.

Paper size A3

0 100 200 400

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

CLIENTS | PEOPLE | PERFORMANCE

Roads and Maritime Services
Kapooka bridge preliminary documentation

Job Number	23-14107
Revision	0
Date	20 Nov 2013

Utilities proposed to be relocated

Figure 2.1

G:\23\14107\GIS\Maps\PreliminaryDocumentation_maps\23_14107_PDFig2.1_ProposedRelocationOfUtilities.mxd

Suite 3, Level 1, 161-169 Baylis Street Wagga Wagga NSW 2650 Australia T 61 2 6923 7400 F 61 2 6971 9565 E wgamail@ghd.com W www.ghd.com

Data source: NSW LPI: Roads, railway lines, rivers, drainage lines, Silvalite Reserve boundary and suburbs - 2005; NSW Roads and Maritime Services: Road design and proposal features - 2011, aerial photography - 2011 & 2006. Created by:rtrobinson

2.3 Operational requirements of the action

The proposal would provide an improved road alignment servicing vehicles travelling on the Olympic Highway.

Roads and Maritime would conduct a number of routine maintenance activities during operation as necessary. Maintenance activities would include, but are not limited to:

- Management of roadside vegetation including trimming of growth on trees and shrubs and minor lopping and removal to ensure sight distances, stopping distances and the vegetation-free area (maintenance clear zone). Management may also cover removal of vegetation for fire management and removal or control of noxious and environmental weeds.
- Regular inspection and repair as required of pavement, bridge and drainage structures and other roadside assets (including environmental controls and management measures). Other activities may include cleaning of drainage structures to maintain water flow or replacement of damaged safety barriers, guide posts or signage.
- Removal of any litter, obstructing material and accumulated debris.

2.4 Timing and duration of the proposal

2.4.1 Construction

The proposal would be constructed over about 18 months. Construction is planned to start in 2014.

It is anticipated that most of the work for the proposal would be completed in accordance with OEH's recommended standard hours for construction work (DECC 2009b):

- Monday to Friday: 7am to 6pm.
- Saturday: 8am to 1pm.
- Sundays and public holidays: no work.

Blasting would be conducted during the following hours (DECC 2009b):

- Monday to Friday: 9am to 5pm.
- Saturday: 9am to 1pm.
- Sundays and public holidays: no blasting.

2.4.2 Operation

The proposal would be operational before the end of 2015. This would include allowing traffic to use all of the proposed road and bridge structures.

2.5 Extent of potential direct and indirect impacts

The area that would be directly impacted by the proposal covers an area of 34.8 hectares. The features of the proposal are shown in Figure 1.2.

Generally, the extent of indirect impacts is considered to be the area within 500 metres of the proposal (the study area). Indirect impacts may however extend beyond this area. For example, the proposal has the potential to cause fragmentation of woodland. The potential indirect effects of fragmentation on fauna and flora have the potential to occur outside the study area.