

1. Summary/Purpose of Activity

The purpose of the bulk earthworks is to create a stable formation suitable for the pavement to be constructed so that it meets its intended design life. The bulk earthworks activity is carried out using material from within the construction site to avoid any need to import material from external sources. Bulk earthworks are carried out using conventional cut to fill technique in which material is carted from each cut using scrapers, or excavators and moxies/truck and dogs to fill areas. Blasting will occur in selected large cuts where rock cannot be excavated using conventional techniques.

2. Objectives of this WMS

The objectives of this WMS are to carry out approx. 3 Million cu.m of bulk earthworks within construction site with controlled and systematic approach, ensuring compliance with contract deed, minimising impacts on the environment, meeting highest safety and quality standards.

3. Area/Location of Activity/Site:

Within the approved project corridor from chainage 12,900 to chainage 39,500.

The project has been divided into three distinct zones i.e

Zone 1 ch 12,900 to ch 22,000,

Zone 2 ch 22,000 to ch 32,000,

Zone 3 ch 32,000 to ch 39,500

4. Timing of works/Expected duration:

Abigroup has prepared a detailed mass haul diagram showing cut to fill requirements and material movement also initial construction program.

Based on initial plan it is anticipated that earthworks in Zone 1 will be completed in 32 weeks, in Zone 2 will be completed in 26 weeks and in Zone 3 will be completed in 36 weeks from commencement.

At this stage the programme has Zone 1 starting August 2011.

Zone 2 and 3 will start once the CMS is reviewed.

5. Approvals Required

Bulk earthworks are major activity on the project and require approval of Abigroup CEMP prior to commencement.

Consultation Requirements:

Prior to commencement of Bulk earthworks a planning session to be conducted to discuss various stages of earthworks including but not limited to safety, environmental, quality etc. All interested parties (RTA, Abigroup, Davis Langdon, EMR, and Geotechnical etc) will be required to attend the planning session.

Community consultation will be undertaken in accordance with the Community Involvement Plan.

6. Incident Response

In the event of an incident such as unauthorised access to or impacts to threatened vegetation/sensitive areas, plant collision, the Site Supervisor will immediately direct works to stop before contacting the Environmental/Safety Manager. The Environmental/Safety Manager, or their delegate, will respond to the incident in accordance with Sections of the early works EMP/SMP.

7. Relevant References:

The information included in this WMS has been drawn from the Construction EMP and the relevant Sub Plans. For additional information related to this WMS refer to the following documents:

- Ministers Conditions of Approval and Statement of Commitments for the project;
- Construction Environmental Management Plan; and
- Soil and Erosion Control Plan.
- Earthworks Inspection and Test Plans
- Utilities Drawing Package
- Gate Plan
- Community Involvement Plan
- Topsoiling and Stockpiling Construction Method Statement
- Register of Hold and Witness Points
- Noise and Vibration Management Sub Plan
- Air Quality Management Sub Plan

8. Related attached documents:

- Mass Haul Diagram

Hunter Expressway – Kurri Kurri to Branxton

Level	Likelihood	Description
A	Almost certain	Is expected to occur during the project, 90% or > probability
B	Likely	Will probably occur during the project, ~50% probability
C	Moderate	Might occur at sometime during the project, ~10% probability
D	Unlikely	Could occur at some time during the project, ~1% probability
E	Rare	Only occur in exceptional circumstances, < 1% probability

Level	Consequence	Description
1	Insignificant	Negligible Discharge
2	Minor	Uncontrolled Discharges in Minor Quantities
3	Moderate	Moderate Breach of Environmental Statutes
4	Major	Major Breach of Environmental Statutes
5	Severe	Shutdown of Project Due to Environmental Breach

Likelihood	Consequences				
	1 Insignificant	2 Minor	3 Moderate	4 Major	5 Severe
A (Almost Certain)	Medium	Significant	High	High	Extreme
B (Likely)	Medium	Medium	Significant	High	Extreme
C (Moderate)	Low	Medium	Significant	High	High
D (Unlikely)	Low	Low	Medium	Significant	High
E (Rare)	Low	Low	Low	Medium	Significant

Construction Work Method and Risk Assessment

#	Sequence of Work Activities (How will work be done?)	Potential Hazards (What harm can occur?)	Risk	Safeguards/controls (How can the risk be minimised?)	Responsibility (Who will direct works to ensure compliance?)
Planning / Pre-construction					
1	Mark out sensitive areas within or adjacent to works area.	Damage to flora, fauna and/or heritage items.	High (C4)	Survey and fence the sensitive areas within/adjacent to the works area in accordance with the sensitive area diagrams and in consultation with the Project Ecologist.	Surveyor / Environmental Manager / Ecologist
2	Mark out limit of approved project boundary	Unauthorized damage to items of significance	High (C4)	Mark out the approved work area. No go zone behind danger tape.	Surveyor / Environmental Manager
3	Permit to Excavate and Permit to Works under Power lines	Damage to services.	High (C5)	Complete a Permit to Excavate and Permit to Works under Power lines and have them approved for the works.	Foreman / Project Engineer
				Clearly mark the location of any underground and overhead services on the ground.	Foreman / Project Engineer
4	Safe work method statements	Unsafe work practices	High (B4)	SWMS for each work activity to be completed prior to commencing any activity, these are to be reviewed through out the project and approved by Project Safety Manager.	Foreman / Project Engineer
				UHF channel for works to be agreed at tool box prior to commencement of works. Channels to be displayed on every gate sign. Site Safety Manual kept in nominated vehicle	Foreman / Project Engineer
				External Plant Checklist, Operator assessment, tickets/licenses, Insurances to be checked and completed prior to commencement of the works.	Foreman / Project Engineer
5	Provide training to personnel and sub-contractors involved	Non-compliance with work methods.	High (C4)	Toolbox field operators on the requirements of this WMS prior to commencement of the works.	Foreman

#	Sequence of Work Activities (How will work be done?)	Potential Hazards (What harm can occur?)	Risk	Safeguards/controls (How can the risk be minimised?)	Responsibility (Who will direct works to ensure compliance?)
6	Planning for the installation of the erosion and sedimentation controls	Uncontrolled run off associated with the works	Significant (D4)	Prepare an ESCP for the area. To be implemented prior to commencement of works and completed as a priority.	Project Engineer/ Environmental Officer
7	Community consultation	Community are exposed to impacts without prior notice	Significant (C3)	Letter drops and other method to notify residents at least 5 days prior to commencement Works will be limited to approved work hours Monday to Friday 7am-6pm and Saturday 8am to 1pm. No works outside these hours unless approved by DECC or conducting emergency works.	Community Relations Manager/ Project Engineer
8	Hold Point Release	Non-compliance with work methods	High (C4)	Ensure all of the activities above are completed and signed by the relevant persons/s prior to commencing further works.	QA Manager/Engineer
Construction					
9	Completion of clearing activities	Spread of weeds on and off site	Significant (A2)	Following clearing, assess edges of work area for any noxious weed regrowth and spray as required. SWMS required to be approved prior to any weed spray treatment.	Environment / Ecologist
10	Transport of earthmoving equipment to/around/ from site	Interaction with local traffic and noise complaints	Significant (A2)	Implement procedures for entering / exiting of site as outlined in relevant TCP. Access to site is only to be through gates detailed on the Gate Plan.	Traffic Engineer
				Ensure that Traffic Control is in place as required.	Foreman
				Only float plant within approved construction hours.	Foreman
11	Material hauling using scrapers, dozers and rollers	Risk to public safety.	High (B4)	Clear the area and ensure public access is prevented. Cease activities if any public approach too close to the work area for the activity. Install manproof fencing to delineate the work area to stop unauthorized access	Foreman

#	Sequence of Work Activities (How will work be done?)	Potential Hazards (What harm can occur?)	Risk	Safeguards/controls (How can the risk be minimised?)	Responsibility (Who will direct works to ensure compliance?)
11	Material hauling using scrapers, dozers and rollers	Risk to public safety.	High (B4)	Implement procedures for entering / exiting of site as outlined in relevant TCP. Access to site is only to be through gates detailed on the Gate Plan. Traffic controllers to stop traffic when plant is crossing local roads.	Project Engineer
		Pollution of waterways due to spills/leaks.	High (C5)	Ensure equipment / vehicles are serviced.	Foreman / Subcontractor
				Any refuelling to be done min 20m away from waterways.	Foreman / Subcontractor
				No fuel is to be stored on site overnight.	Foreman / Subcontractor
				Spill kit to be onsite during works.	Foreman / Subcontractor
				Report any spills to EM and clean up.	Foreman / Subcontractor
				Provide bunded and impervious storage areas for fuels and chemicals. Storage shall be in accordance with AS1940 – Storage and Handling of Flammable and Combustible Liquids and AS4452 - The Storage and Handling of Toxic Substances the Dangerous Goods Act 1975 where required. Bunded areas shall have a storage capacity of 120% of the volume of the largest container stored.	Foreman
All plant to be checked and must have stickers prior to start of works.	Foreman				
Damage to flora, fauna, heritage items or work outside of project boundary	High (C4)	No clearing to be conducted outside of the approved site boundary. No vehicles to be parked behind marked danger tape.	Environmental Manager / Foreman		

#	Sequence of Work Activities (How will work be done?)	Potential Hazards (What harm can occur?)	Risk	Safeguards/controls (How can the risk be minimised?)	Responsibility (Who will direct works to ensure compliance?)
11	Material hauling using scrapers, dozers and rollers	Noise and causing annoyance to local residents	High (C4)	Works are only to occur 7:00am to 6:00pm Monday to Friday; or 8:00am to 1:00pm Saturday	Foreman
				Ensure that the minimum separation distances for specific plant outlined in Table 5.4 of the Construction Noise and Vibration Management Sub-Plan are adhered to	Foreman
				Ensure plant / equipment is fitted with appropriate silencers and is maintained in an efficient condition. Use smallest available plant necessary to undertake work.	Foremen
				Monitor noise levels fortnightly	Safety Manager
		Noise and causing annoyance to local residents	High (C4)	All noise complaints to be recorded and actioned.	Foremen Community Relations Manager
				Equipment/plant that is not in use will be switched off.	Foreman
		Air pollution caused by dust / rocks causing annoyance to local residents / road users.	High (C4)	Use water carts to dampen cleared areas and stockpiles as required. Monitor dust levels.	Foreman/ Environmental Manager
		Pollution caused by incorrect disposal of wastes offsite.	Significant (D4)	Minimize waste where possible. Hazardous wastes to be removed and disposed of by a licensed contractor in correct manner where required.	Environmental Manager / Foremen
				Classify all waste using the 'Waste Classification Guidelines 2008'.	Environmental Manager / Foremen
		Pollution of waterways due to disturbance of ASS	High (A4)	Eliminate or minimize excavation in alluvial soils. Refer to Geotechnical Report for details on mapped ASS risk areas.	Foreman / Project Engineer / Environmental Manager

#	Sequence of Work Activities (How will work be done?)	Potential Hazards (What harm can occur?)	Risk	Safeguards/controls (How can the risk be minimised?)	Responsibility (Who will direct works to ensure compliance?)
11	Material hauling using scrapers, dozers and rollers	Pollution of waterways due to disturbance of ASS	High (A4)	The need for groundwater dewatering will be eliminated or limited, particularly in areas of potential acid sulfate soils.	Foreman / Project Engineer / Environmental Manager
				Establish an acid sulfate soil treatment area as per ASSMAC guidelines prior to any excavation in high risk areas of ASS or PASS. Consult with DECCW and NSW DI&I if ASS is encountered. Refer to Acid Sulfate Soil EMP for further requirements regarding treatment area.	
				Trucks with a sealable tailgate must be used for the transport of ASS to prevent leakage of ASS materials.	
				Ensure no ASS contaminated soils are imported onsite.	
		Finding new heritage items	Low (E3)	In the event that human remains or unknown heritage items are discovered, stop work and contact the Environmental Manager. Contact the Police if human remains are found.	Foreman
Pollution of waterways due to sedimentation	Significant (C3)	Appropriate ERSED controls to be in place prior to commencement of earthworks. ERSED controls to be checked by Project Verifier prior to commencement of work.	Foremen Project Engineer		
Interaction with traffic	Significant (B3)	TCP and VMP prepared prior to any works involving scrapers crossing local roads Traffic control in place for any hauls that require equipment to cross local roads	Project Engineer Foremen		
Carting mud on local roads	High (A4)	Wash out on site. Cattle grid to be installed. Tyres to be cleaned prior to travelling on local road.	Foreman		
12	Drill and blast using explosives in selected cuts	Noise and vibration causing annoyance to local residents and damage to structures	High (A4)	Vibration limited to that outlined in the following standards: - German Standard DIN 4150 and British Standard BS 7385: Part 2 – 1993 for structural vibration damage - British Standard BS 6472 and Australian Standard AS 2670 for human exposure to vibration	Project Engineer

#	Sequence of Work Activities (How will work be done?)	Potential Hazards (What harm can occur?)	Risk	Safeguards/controls (How can the risk be minimised?)	Responsibility (Who will direct works to ensure compliance?)
12	Drill and blast using explosives in selected cuts	Noise and vibration causing annoyance to local residents and damage to structures	High (A4)	Dilapidation surveys of properties within 200 metres of blast	Project Engineer
				All noise complaints to be recorded and closed out.	Foremen Community Relations Manager
				Blast Management Strategy to be developed and included in Noise and Vibration Management Sub Plan.	Environmental Officer
				Blasts limited to one detonation per day	Project Engineer
				Reduced scale blasting trials to occur to determine the site specific blast response characteristics prior to full blasting occurs	Project Engineer
				Blasting only to occur between the hours of 10am and 3pm Monday to Fridays and 10am to 1pm on Saturdays	Foreman
		Noise and vibration causing annoyance to local residents and damage to structures	High (A4)	Minimum of 48 hours notice to occupants located within 500m of blasting and blasting schedule provided to residents	Community Relations Manager
		Risk to public safety.	High (B4)	Clear the area and ensure public access is prevented. Cease activities if any public approach too close to the work area for the activity.	Foreman
				Install fencing to delineate the work area to stop unauthorized access Undertake checks of the blast area as identified in the Drilling and Blasting Inspection and Test Plan.	Project Engineer Shotfirer
				Risk to public safety.	High (B4)

#	Sequence of Work Activities (How will work be done?)	Potential Hazards (What harm can occur?)	Risk	Safeguards/controls (How can the risk be minimised?)	Responsibility (Who will direct works to ensure compliance?)
13	Material hauling using excavators and moxies/50T dumps/truck and dogs	Risk to public safety.	High (B4)	Clear the area and ensure public access is prevented. Cease activities if any public approach too close to the work area for the activity.	Foreman
				Install fencing to delineate the work area to stop unauthorized access	
		Pollution of waterways due to spills/leaks.	High (C5)	Implement procedures for entering / exiting of site as outlined in relevant TCP. Access to site is only to be through gates detailed on the Gate Plan.	Project Engineer
				Ensure equipment / vehicles are serviced.	Foreman / Subcontractor
				Any refuelling to be done min 20m away from waterways.	Foreman / Subcontractor
				No fuel is to be stored on site overnight.	Foreman / Subcontractor
		Pollution of waterways due to spills/leaks.	High (C5)	Spill kit to be onsite during works.	Foreman / Subcontractor
				Report any spills to EM and clean up.	Foreman / Subcontractor
		Damage to flora, fauna, heritage items or work outside of project boundary	High (C4)	Provide bunded and impervious storage areas for fuels and chemicals. Storage shall be in accordance with AS1940 – Storage and Handling of Flammable and Combustible Liquids and AS4452 - The Storage and Handling of Toxic Substances the Dangerous Goods Act 1975 where required. Bunded areas shall have a storage capacity of 120% of the volume of the largest container stored.	Foreman
				No clearing to be conducted outside of the approved site boundary.	Environmental Manager / Foreman

#	Sequence of Work Activities (How will work be done?)	Potential Hazards (What harm can occur?)	Risk	Safeguards/controls (How can the risk be minimised?)	Responsibility (Who will direct works to ensure compliance?)
13	Material hauling using excavators and moxies/5-T dumps/truck and dogs	Noise and causing annoyance to local residents	High (C4)	Works are only to occur 7:00am to 6:00pm Monday to Friday; or 8:00am to 1:00pm Saturday	Foreman
				Ensure that the minimum separation distances for specific plant outlined in Table 5.4 of the Construction Noise and Vibration Management Sub-Plan are adhered to	Foreman
				Ensure plant / equipment is fitted with appropriate silencers and is maintained in an efficient condition. Use smallest available plant necessary to undertake work.	Foremen
				All noise complaints to be recorded and closed out.	Foremen Community Relations Manager
				Equipment that is not in use will be switched off.	Foreman
		Air pollution caused by dust / rocks causing annoyance to local residents / road users.	High (C4)	Trucks entering and leaving the premises that are carrying dust generating loads must be covered at all times except during loading and unloading. Wash dirty truck tyres prior to travelling on local roads.	Foreman
		Air pollution caused by dust / rocks causing annoyance to local residents / road users.	High (C4)	Use water carts to dampen cleared areas and stockpiles as required.	Foreman
		Pollution caused by incorrect disposal of wastes offsite.	Significant (D4)	Minimize waste where possible. Hazardous wastes to be removed and disposed of by a licensed contractor in correct manner where required.	Environmental Manager / Foremen
Classify all waste using the 'Waste Classification Guidelines 2008'.	Environmental Manager / Foremen				

#	Sequence of Work Activities (How will work be done?)	Potential Hazards (What harm can occur?)	Risk	Safeguards/controls (How can the risk be minimised?)	Responsibility (Who will direct works to ensure compliance?)
13	Material hauling using excavators and moxies/50T dumps/truck and dogs	Pollution of waterways due to disturbance of ASS	High (A4)	Eliminate or minimize excavation in alluvial soils. Refer to Geotechnical Report for details on mapped ASS risk areas.	Foreman / Project Engineer / Environmental Manager
				The need for groundwater dewatering will be eliminated or limited, particularly in areas of potential acid sulfate soils.	
				Establish an acid sulfate soil treatment area as per ASSMAC guidelines prior to any excavation in high risk areas of ASS or PASS. Consult with DECCW and NSW DI&I if ASS is encountered. Refer to Acid Sulfate Soil EMP for further requirements regarding treatment area.	
				Trucks with a sealable tailgate must be used for the transport of ASS to prevent leakage of ASS materials.	
				Ensure no ASS contaminated soils are imported onsite.	
		Finding new heritage items	Low (E3)	In the event that human remains or unknown heritage items are discovered, stop work and contact the Environmental Manager. Contact the Police if human remains are found.	Foreman
		Pollution of waterways due to sedimentation	Significant (C3)	Appropriate ERSED controls to be in place prior to commencement of earthworks. ERSED controls to be checked by Project Verifier prior to commencement of work.	Foremen Project Engineer
Interaction with traffic	Significant (B3)	TCP and VMP prepared prior to any works involving scrapers crossing local roads Traffic control in place for any hauls that require equipment to cross local roads	Project Engineer Foremen		

#	Sequence of Work Activities (How will work be done?)	Potential Hazards (What harm can occur?)	Risk	Safeguards/controls (How can the risk be minimised?)	Responsibility (Who will direct works to ensure compliance?)
15	Stockpiling of materials	Pollution of waterways due to sedimentation	Significant (C3)	<p>Appropriate ERSED controls to be in place prior to commencement of earthworks.</p> <p>ERSED controls to be checked by Project Verifier prior to commencement of work.</p> <p>Topsoil stockpiles to be seeded within 7 days of completion of each 500m² of batter face.</p>	<p>Foremen</p> <p>Project Engineer</p>
16	Batter treatment	Pollution of waterways due to sedimentation	Significant (C3)	<p>Appropriate ERSED controls to be in place prior to commencement of earthworks.</p> <p>ERSED controls to be checked by Project Verifier prior to commencement of work.</p> <p>Topsoil on batters to be seeded as soon as practical after completion.</p>	<p>Foremen</p> <p>Project Engineer</p>
17	Water for construction	Use of water without the appropriate approvals	Medium (D3)	Water Management Strategy in place prior to commencement of drawing water.	Project Engineer
18	Water collected in basins after rainfall events	Pollution of waterways due to sedimentation	Significant (C3)	All basins to be flocculated within 24 hours of a rainfall event.	<p>Foreman</p> <p>Project Engineer</p>

CMS Toolbox

Also refer to Abigroup standard toolboxes

- Role and responsibilities:
 - Foremen: Manage day to day works in the field. Ensure activities are undertaken in accordance with this CMS.
 - Engineers: Provide technical support and management of scope and program of works. Manage quality through Abigroup Quality system QESE.
 - Environmental Officer: Undertake inspections and conduct planning to ensure that no environmental incidents occur.
 - Community Relations Manager: Manage all interactions and information to the community including members of the public and any other stakeholders.
 - Surveyor: Mark out works in accordance with design
- Surveys to be completed to identify the areas to be protected and the project boundary. These areas are to be marked/flagged and works must stay outside of these areas.
- Conditions of Permit to Excavate and Permit to Work under Power lines to be tool boxed.
- SWMS to be tool boxed.
- If an injured animal is found, advise the EM immediately.
- Minimize ground disturbance and install ERSED controls as required.
- Prevent pollution of waterways due to spills/leaks. Clean up and report all spills to the EM.
- Works are only to occur 7:00am to 6:00pm Monday – Friday and 8:00am to 1:00pm Saturday.
- Minimize noise and ensure plant / equipment is fitted with appropriate silencers and is maintained in an efficient condition.
- Trucks with loads to use dust covers on all local roads/highways.
- Report any complaints to the Community Manager.
- Check weather forecast prior to works. Do not undertake works if rain is predicted. Seal needs to dry prior to rain.

CMS Approval

Approved By		Name	Signature	Date
Originator	Engineer			
Reviewed	Superintendent			
Approved	Project Manager			