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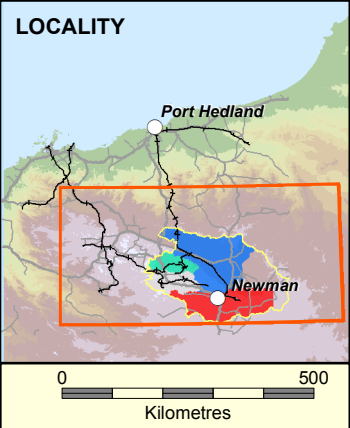
Data source
 DPoW Reserves (DPoW 2015); Roads (MSWA 2012); Aerial Image (BHPBIO); Third Party Data; Disturbance digitized from Aerial Imagery (Aug - Sept 2013) and Approval Documentations up to September 2014. All other data supplied by BHPBIO (2012). Yandicoogina mining area comprises Junction Central, Junction South East, Junction South West and the proposed Osho, Pocket and Billard South mining areas.

LEGEND

- | | | | | |
|-----------------------------|---------------------------|---|---|--|
| Ecohydrology Study Boundary | Townships | Ecological Assets | Ecohydrological Receptors | BHP Billiton Iron Ore Existing Disturbance |
| Karrijini National Park | BHPBIO Mining Areas | Brockman Iron Cracking Clay Communities | Coondewanna Flats including Lake Robinson | Third Party Existing Disturbance |
| Ophthalmia Dam | Third Party Mining Areas | Fortescue Valley Sand Dunes | Ethel Gorge Stygobiont Community | Major Drainage Lines |
| SEA Area Of Interest | BHPBIO Rail Corridor | Karrijini National Park | Freshwater Claypans of the Fortescue Valley | Minor Drainage Lines |
| | Third Party Rail Corridor | Mt Bruce Coolibah-Lignum Flats | Fortescue Marsh | |
| | Great Northern Highway | Mungarooona Range Nature Reserve | Freshwater Claypans of the Fortescue Valley | |
| | Other Roads | West Angelas Cracking Clay Communities | Wona Land System | |

Notes:

The SEA Area Of Interest includes a 50 km buffer around BHP Billiton Iron Ore mining areas and a 10km buffer around it's railway corridor.



Resource Planning Hydrology
 BHP BILLITON IRON ORE

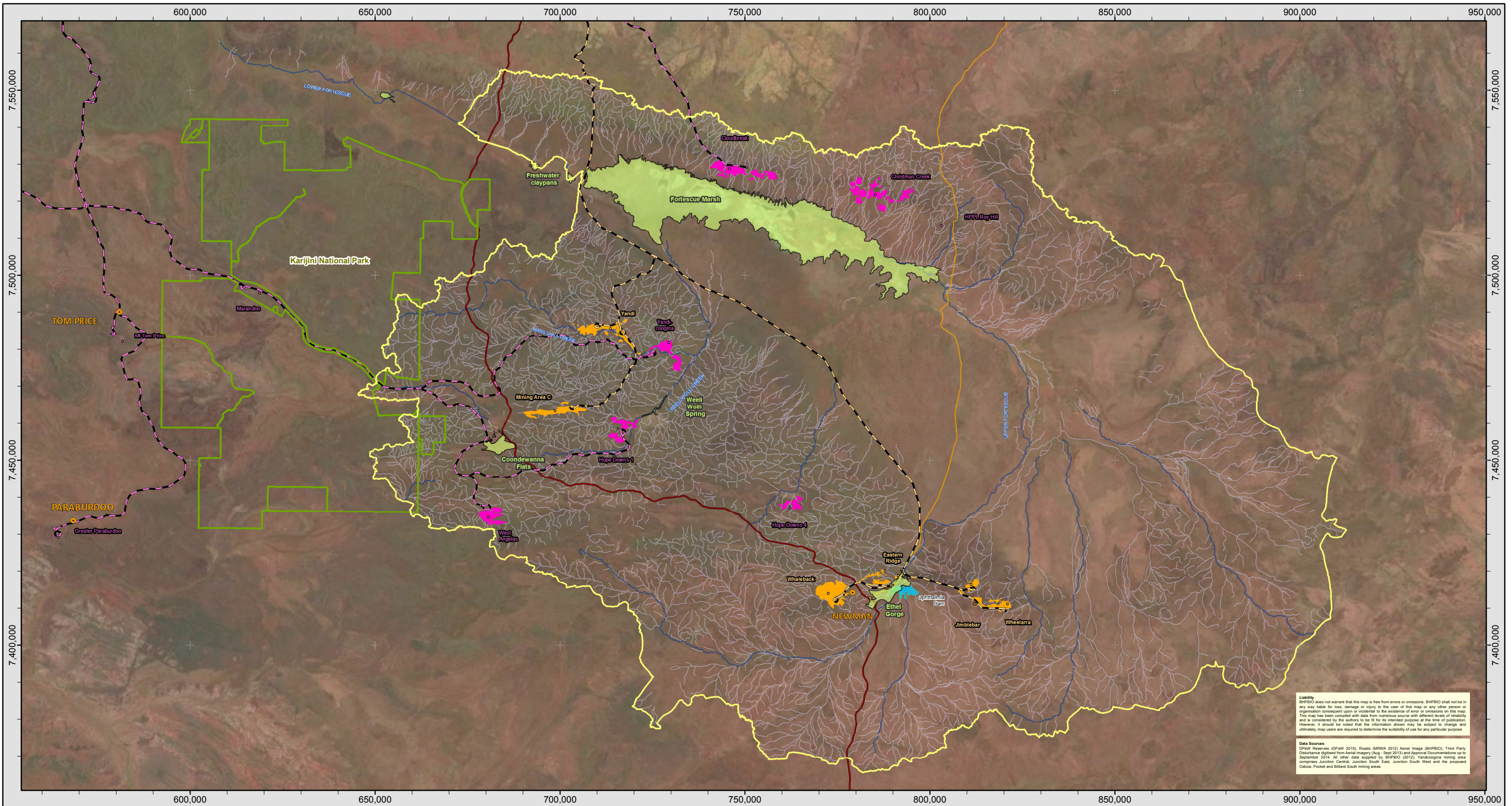
ECOHYDROLOGICAL CHANGE ASSESSMENT
 Location of Ecological Assets

Scale @ A3: 1:1,300,000
 Date: 20/04/2015

Prepared: J Botterill
 Checked: J Vermaak
 Reviewed: J Youngs

Revision: Rev K
 Map: 11

Receptors



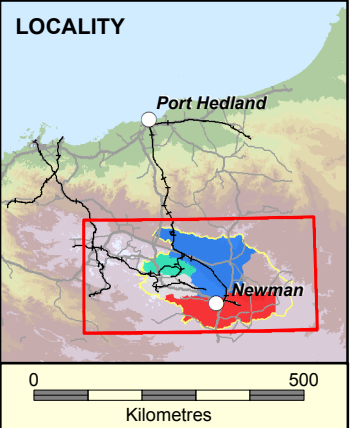
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LEGEND

- Ecohydrology Study Boundary
- Karijini National Park
- Ecohydrological Receptors
- Ophthalmia Dam
- Townships
- BHPBIO Mining Areas
- Third Party Mining Areas
- BHPBIO Rail Corridor (current)
- Third Party Rail Corridor (current)
- Great Northern Highway
- Other Roads
- BHP Billiton Iron Ore Existing Disturbance
- Third Party Existing Disturbance
- Major Drainage Lines
- Minor Drainage Lines

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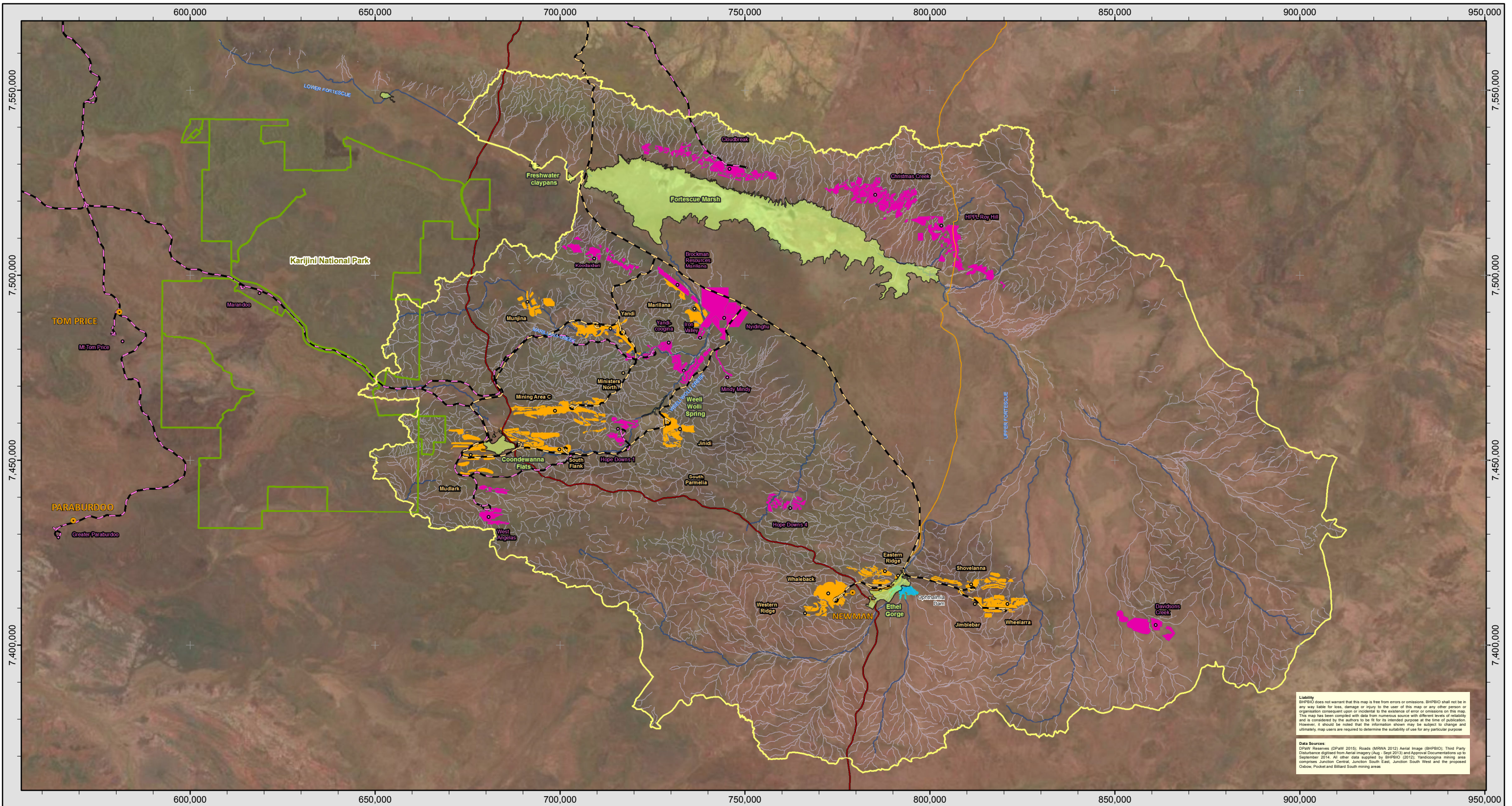


Resource Planning Hydrology
 BHP BILLITON IRON ORE

ECOHYDROLOGICAL CHANGE ASSESSMENT
 Location of BHP Billiton Iron Ore and Third Party Current Mining Areas

Kilometres
 Coordinate System: GDA 1994 MGA Zone 50
 Projection: Transverse Mercator, Datum: GDA 1994, Units: Meter

Scale @ A3: 1:1,000,000	Prepared: J Botterill	Revision: Rev H
Date: 15/04/2015	Checked: J Vermaak	Map: 12
	Reviewed: J Youngs	



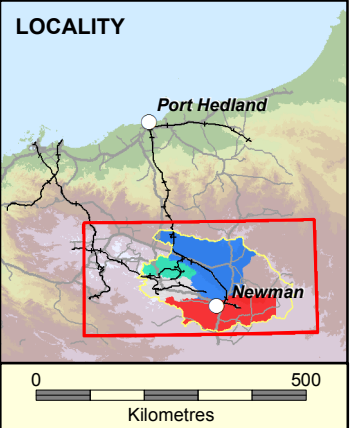
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Data Sources
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LEGEND

- Ecohydrology Study Boundary
- Karijini National Park
- Ecohydrological Receptors
- Ophthalmia Dam
- Townships
- BHPBIO Mining Areas (current & proposed)
- Third Party Mining Areas (current & proposed)
- BHPBIO Rail Corridor (current & proposed)
- Third Party Rail Corridor(current)
- Great Northern Highway
- Other Roads
- Indicative BHP Billiton Iron Ore Disturbance 30% Development Scenario
- Third Party Reasonably Foreseeable Disturbance
- Major Drainage Lines
- Minor Drainage Lines

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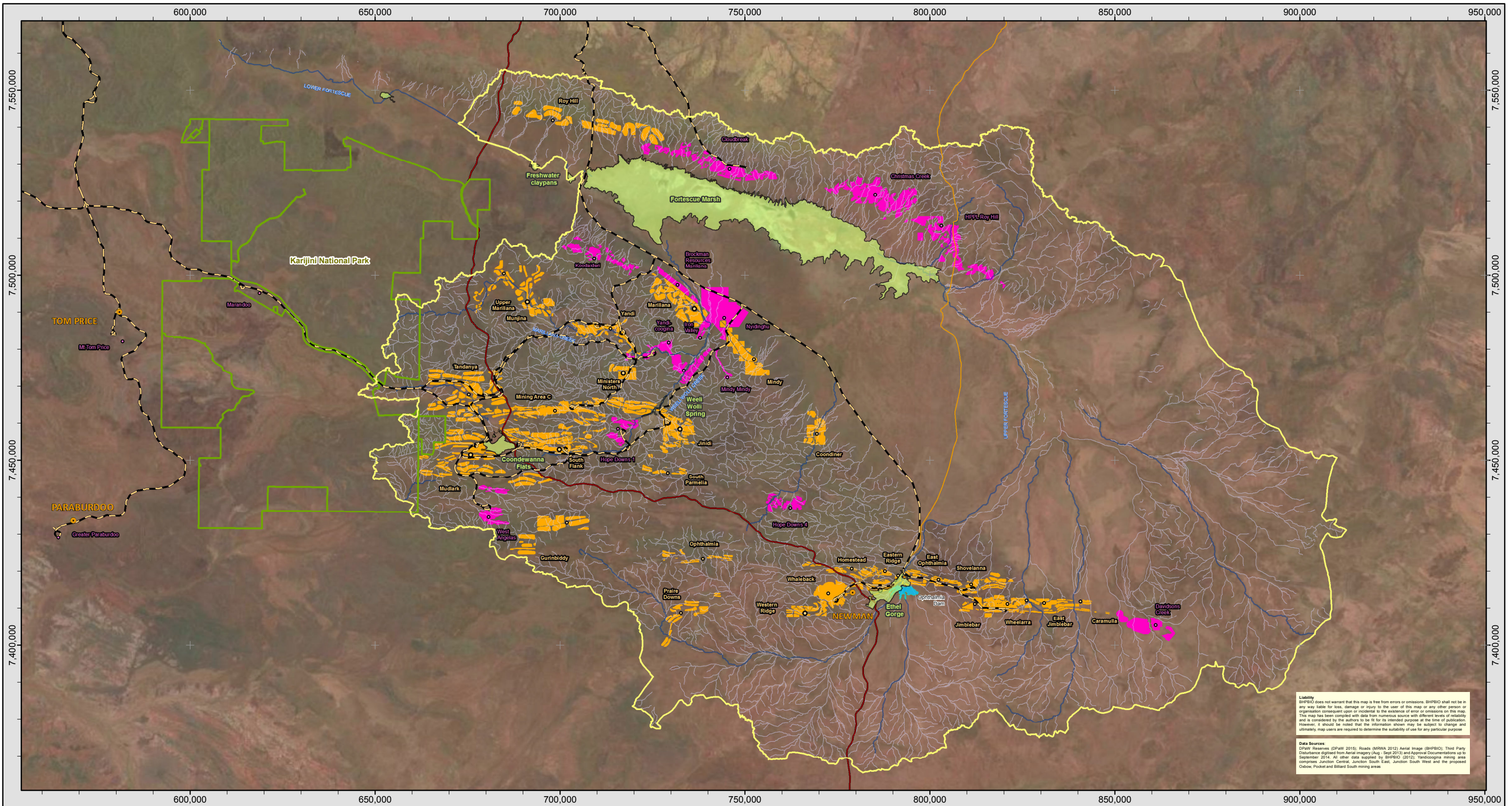
Resource Planning Hydrology
 BHP BILLITON IRON ORE

ECOHYDROLOGICAL CHANGE ASSESSMENT
 Location of BHP Billiton Iron Ore and Third Party Current and Proposed Mining Areas - 30% development

Kilometres
 Coordinate System: GDA 1994 MGA Zone 50
 Projection: Transverse Mercator, Datum: GDA 1994, Units: Metre

Scale @ A3: 1:1,000,000	Prepared: J Botterill	Revision: Rev J
Date: 14/04/2015	Checked: J Vermaak	Map: 13
	Reviewed: J Youngs	

30% Development

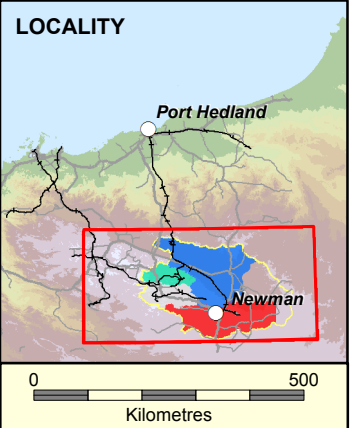


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LEGEND

- Ecohydrology Study Boundary
- Karijini National Park
- Ecohydrological Receptors
- Ophthalmia Dam
- Townships
- BHPBIO Mining Areas (current & proposed)
- Third Party Mining Areas (current & proposed)
- BHPBIO Rail Corridor (current & proposed)
- Great Northern Highway
- Other Roads
- Indicative BHP Billiton Iron Ore Disturbance Full Development Scenario
- Third Party Reasonable Foreseeable Disturbance
- Major Drainage Lines
- Minor Drainage Lines



Resource Planning Hydrology
 BHP BILLITON IRON ORE

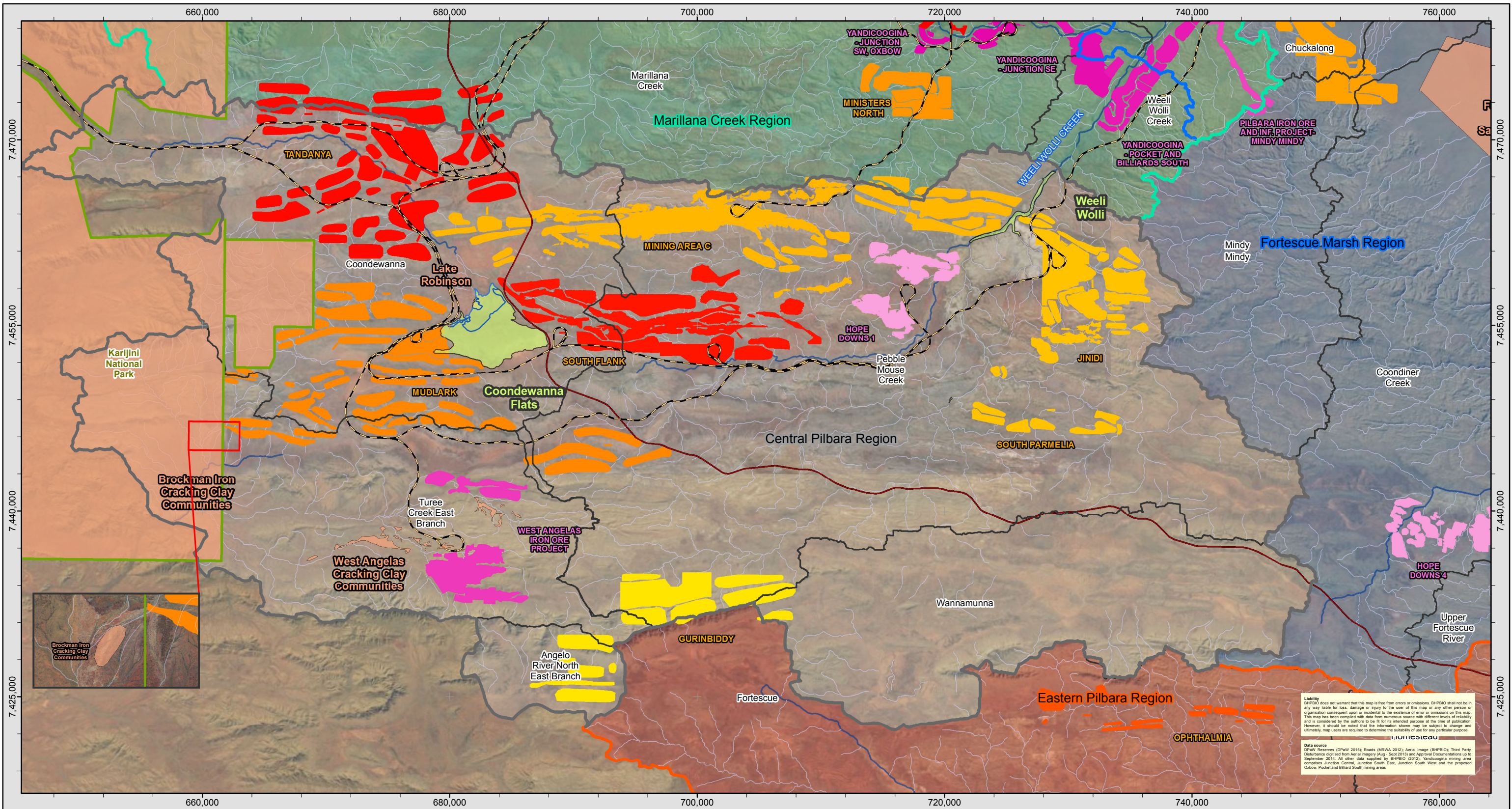
ECOHYDROLOGICAL CHANGE ASSESSMENT
 Location of BHP Billiton Iron Ore and Third Party Current and Proposed Mining Areas - Full Development

Coordinate System: GDA 1994 MGA Zone 50
 Projection: Transverse Mercator, Datum: GDA 1994, Units: Meter

Scale @ A3: 1:1,000,000	Prepared: J Botterill	Revision: Rev J	
Date: 15/04/2015	Checked: J Vermaak	Map: 14	
	Reviewed: J Youngs		

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Full Development



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LEGEND

- Karijini National Park
- Surface Water Catchments
- Lake Robinson
- Ecological Receptors
- Ecological Assets
- BHPBIO Rail Corridor (current & proposed)
- Great Northern Highway
- Major Drainage Lines
- Minor Drainage Lines
- BHP Billiton Iron Ore Mining Areas Full Development Scenario
- Third Party Mining Area Reasonably Forseeable Development

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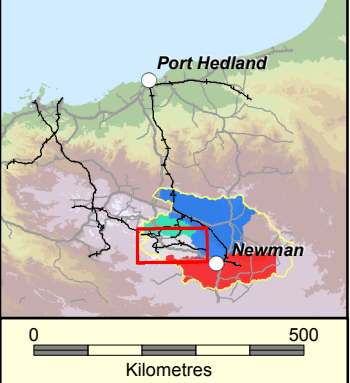
Source: Surface water catchments

Sub-catchment boundaries delineated based on DEM data (data source: 5m DEM LiDAR captured by Fugro Aug 2013 and 30m DEM 1secSRTM from Geoscience Australia)

Source: Major & Minor Drainage Lines

Geoscience Australia 250k Watercourse drainage hierarchy May 2006

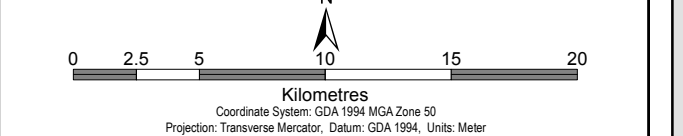
LOCALITY



Resource Planning Hydrology
BHP BILLITON IRON ORE

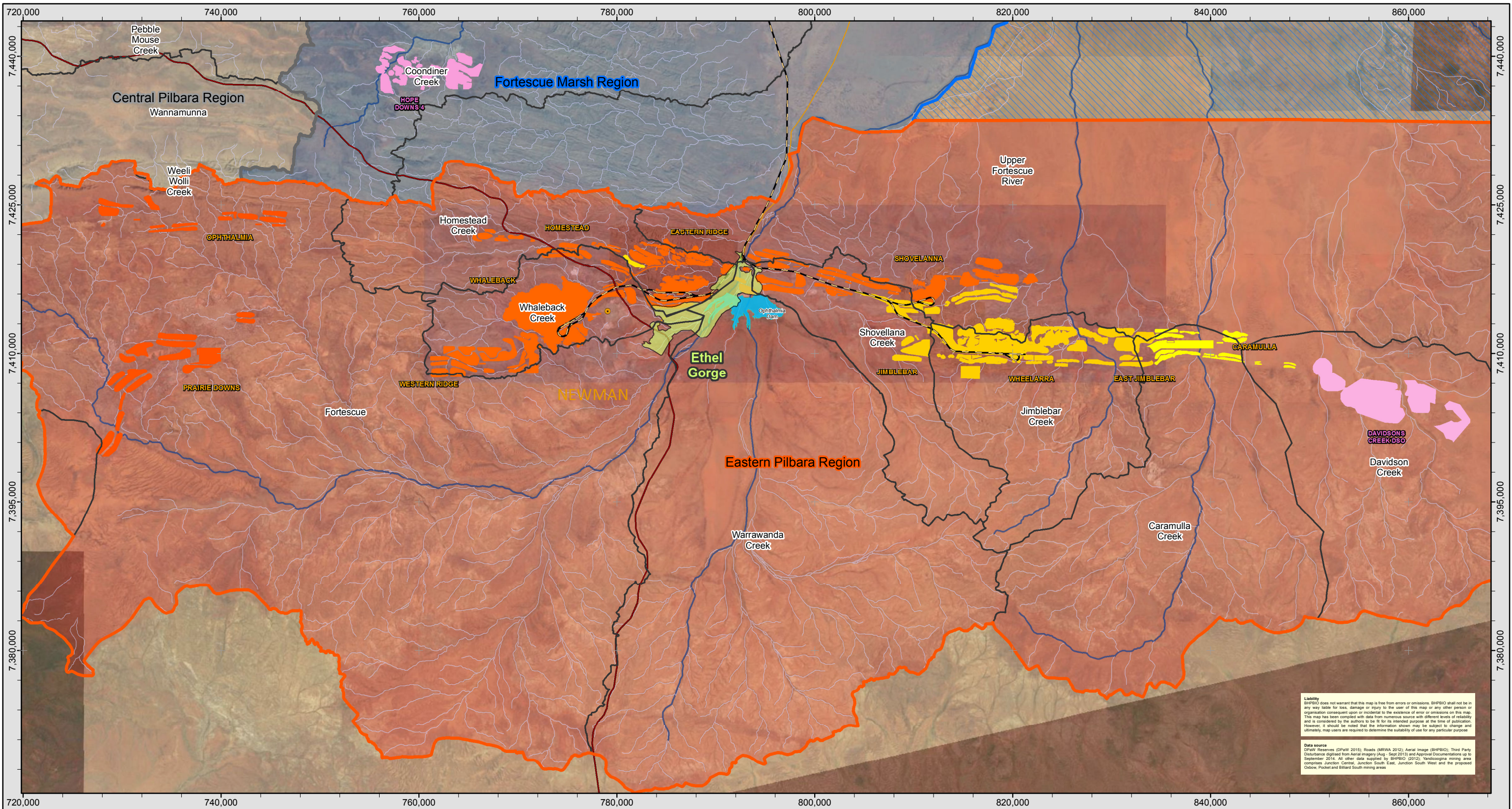
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resourcing the future

ECOHYDROLOGICAL CHANGE ASSESSMENT
Location of Mining Areas - Central Pilbara Region



Scale @ A3: 1:300,000	Prepared: J Botterill	Revision: Rev H
Date: 15/04/2015	Checked: J Vermaak	Map: 15
	Reviewed: J Youngs	

Proposed Mining Areas



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LEGEND

- Surface Water Catchments
- BHPBIO Rail Corridor (current & proposed)
- BHP Billiton Iron Ore Mining Areas Full Development Scenario
- Ecohydrological Receptors
- Great Northern Highway
- Third Party Mining Area Reasonably Forseeable Development
- Ophthalmia Dam
- Other Roads
- Townships
- Major Drainage Lines
- Minor Drainage Lines

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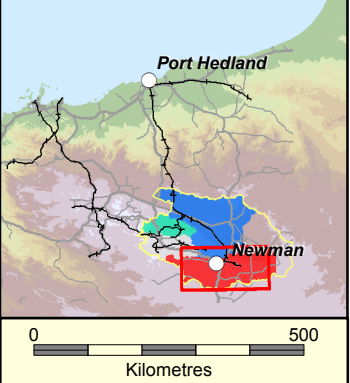
Source: Surface water catchments

Sub-catchment boundaries delineated based on DEM data (data source: 5m DEM LiDAR captured by Fugro Aug 2013 and 30m DEM 1secSRTM from Geoscience Australia)

Source: Major & Minor Drainage Lines

Geoscience Australia 250k Watercourse drainage hierarchy May 2006

LOCALITY



Resource Planning Hydrology
BHP BILLITON IRON ORE

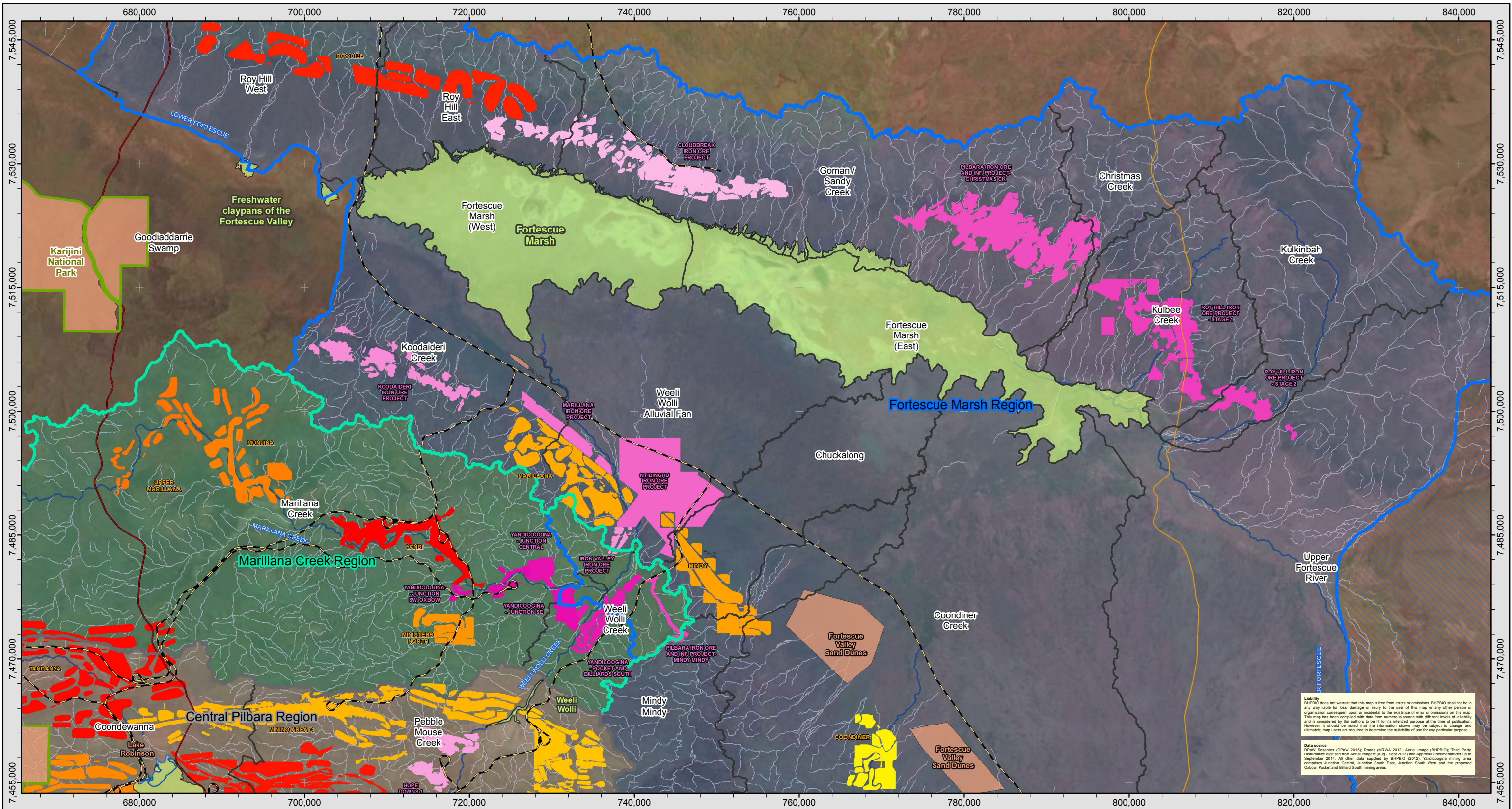
ECOHYDROLOGICAL CHANGE ASSESSMENT
Location of Mining Areas - Eastern Pilbara Region

0 2.5 5 10 15 20
Kilometres

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator; Datum: GDA 1994; Units: Meter

Scale @ A3: 1:375,000	Prepared: J Botterill	Revision: Rev H
Date: 15/04/2015	Checked: J Vermaak	Map: 16
	Reviewed: J Youngs	

Proposed Mining Areas



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LEGEND

- Karijini National Park
- Surface Water Catchments
- Lake Robinson
- Ecohydrological Receptors
- Ecological Assets
- BHPBIO Rail Corridor (current & proposed)
- Great Northern Highway
- Other Roads
- Major Drainage Lines
- Minor Drainage Lines
- BHP Billiton Iron Ore Mining Areas Full Development Scenario
- Third Party Mining Area Reasonably Foreseeable Development

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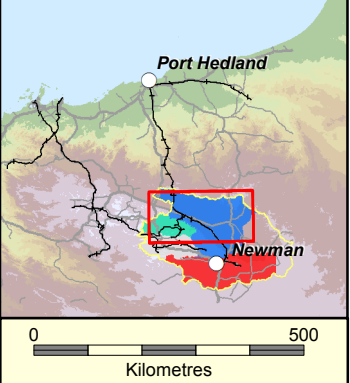
Source: Surface water catchments

Sub-catchment boundaries delineated based on DEM data (data source: 5m DEM LiDAR captured by Fugro Aug 2013 and 30m DEM 1secSRTM from Geoscience Australia)

Source: Major & Minor Drainage Lines

Geoscience Australia 250k Watercourse drainage hierarchy May 2006

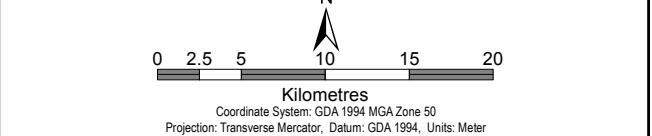
LOCALITY



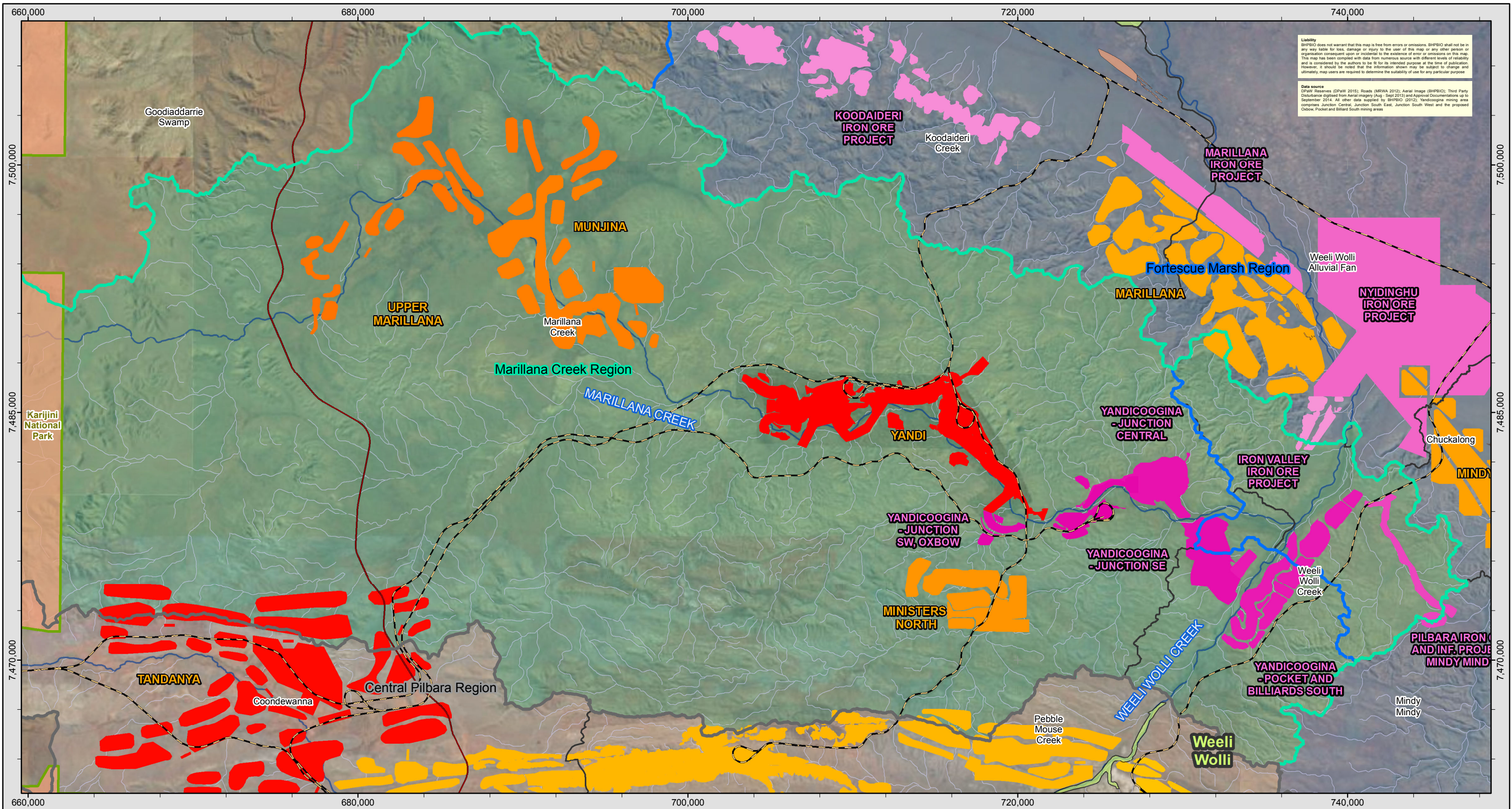
Resource Planning Hydrology
BHP BILLITON IRON ORE

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ECOHYDROLOGICAL CHANGE ASSESSMENT
Location of Mining Areas - Fortescue Marsh Region



Scale @ A3: 1:450,000	Prepared: J Botterill	Revision: Rev H
Date: 15/04/2015	Checked: J Vermaak	Map: 17
	Reviewed: J Youngs	



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LEGEND

Karijini National Park	BHPBIO Rail Corridor (current & proposed)	BHP Billiton Iron Ore Mining Areas Full Development Scenario
Surface Water Catchments	Great Northern Highway	Third Party Mining Area
Ecohydrological Receptors	Major Drainage Lines	Reasonably Foreseeable Development
Ecological Assets	Minor Drainage Lines	

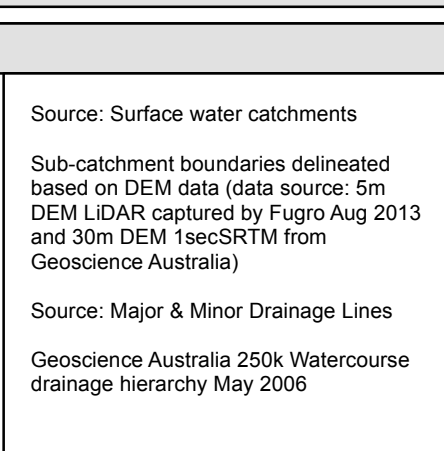
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Source: Surface water catchments

Sub-catchment boundaries delineated based on DEM data (data source: 5m DEM LiDAR captured by Fugro Aug 2013 and 30m DEM 1secSRTM from Geoscience Australia)

Source: Major & Minor Drainage Lines

Geoscience Australia 250k Watercourse drainage hierarchy May 2006



Resource Planning Hydrology
 BHP BILLITON IRON ORE

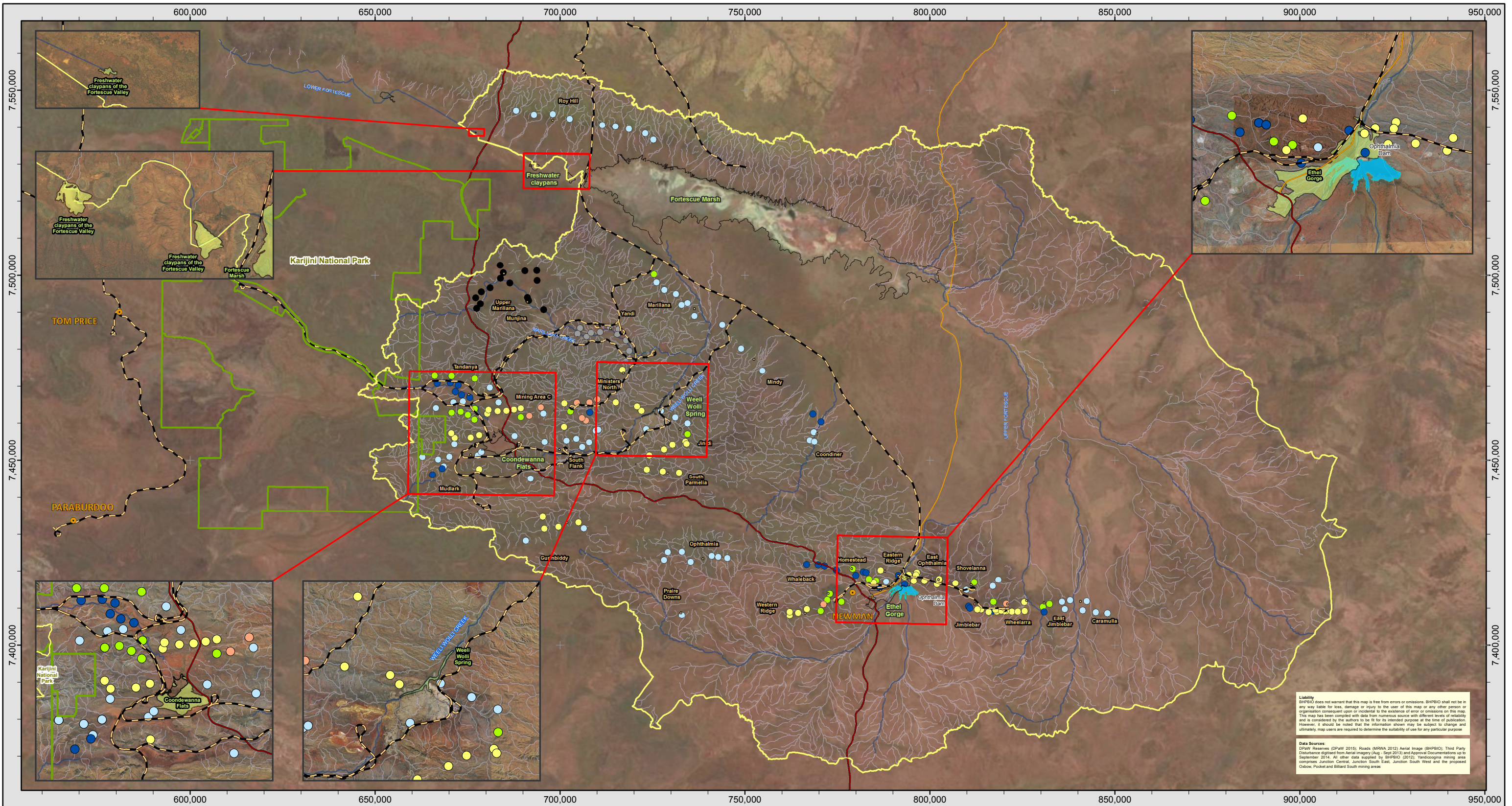
ecohydrological change assessment
 Location of Mining Areas - Marillana Creek Region

0 2.5 5 10 15 Kilometres

Coordinate System: GDA 1994 MGA Zone 50
 Projection: Transverse Mercator; Datum: GDA 1994; Units: Meter

Scale @ A3: 1:225,000	Prepared: J Botterill	Revision: Rev H
Date: 15/04/2015	Checked: J Vermaak	Map: 18
	Reviewed: J Youngs	

Proposed Mining Areas



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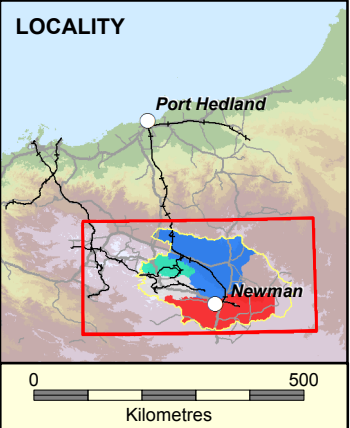
LEGEND

- Ecohydrology Study Boundary
- Karijini National Park
- Ecohydrological Receptors
- Ophthalmia Dam
- Townships
- BHPBIO Mining Areas (current & proposed)
- Great Northern Highway
- Other Roads
- Major Drainage Lines
- Minor Drainage Lines
- Generic Mine Types (GMTs)**
- Fully Connected
- Partially Connected
- Connected
- Isolated
- Channel Iron Deposit - Connected
- Channel Iron Deposit - Not Connected
- Above Water Table

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Notes:

The generic mine type provides an indication of the degree of the hydraulic connectivity of the current and proposed orebodies with the regional groundwater system. The hydraulic connectivity is an important consideration for assessing the scale of dewatering, the drawdown extent and its influence on ecohydrological receptors. The generic mine types were developed for each of the orebodies considering the ore type, extent of below water table mining and the geological setting in relation to regional aquifers.



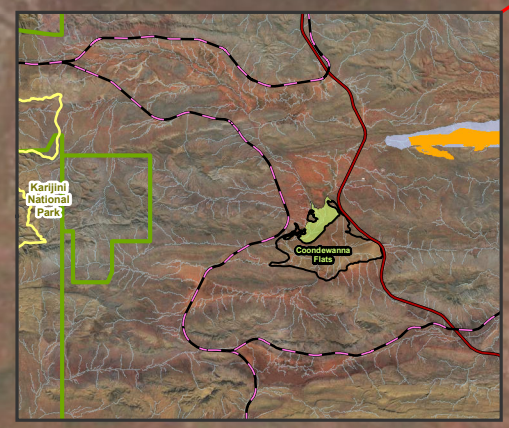
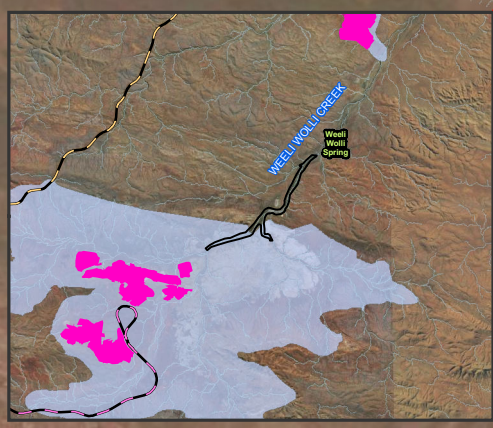
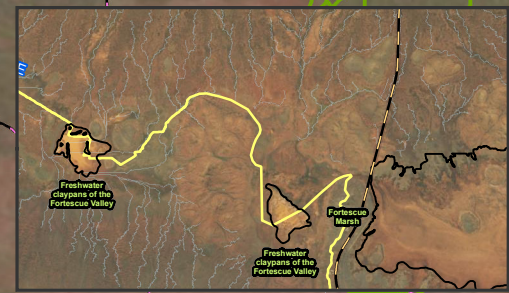
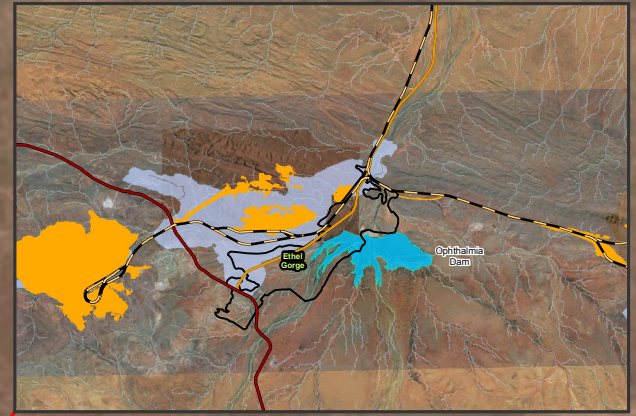
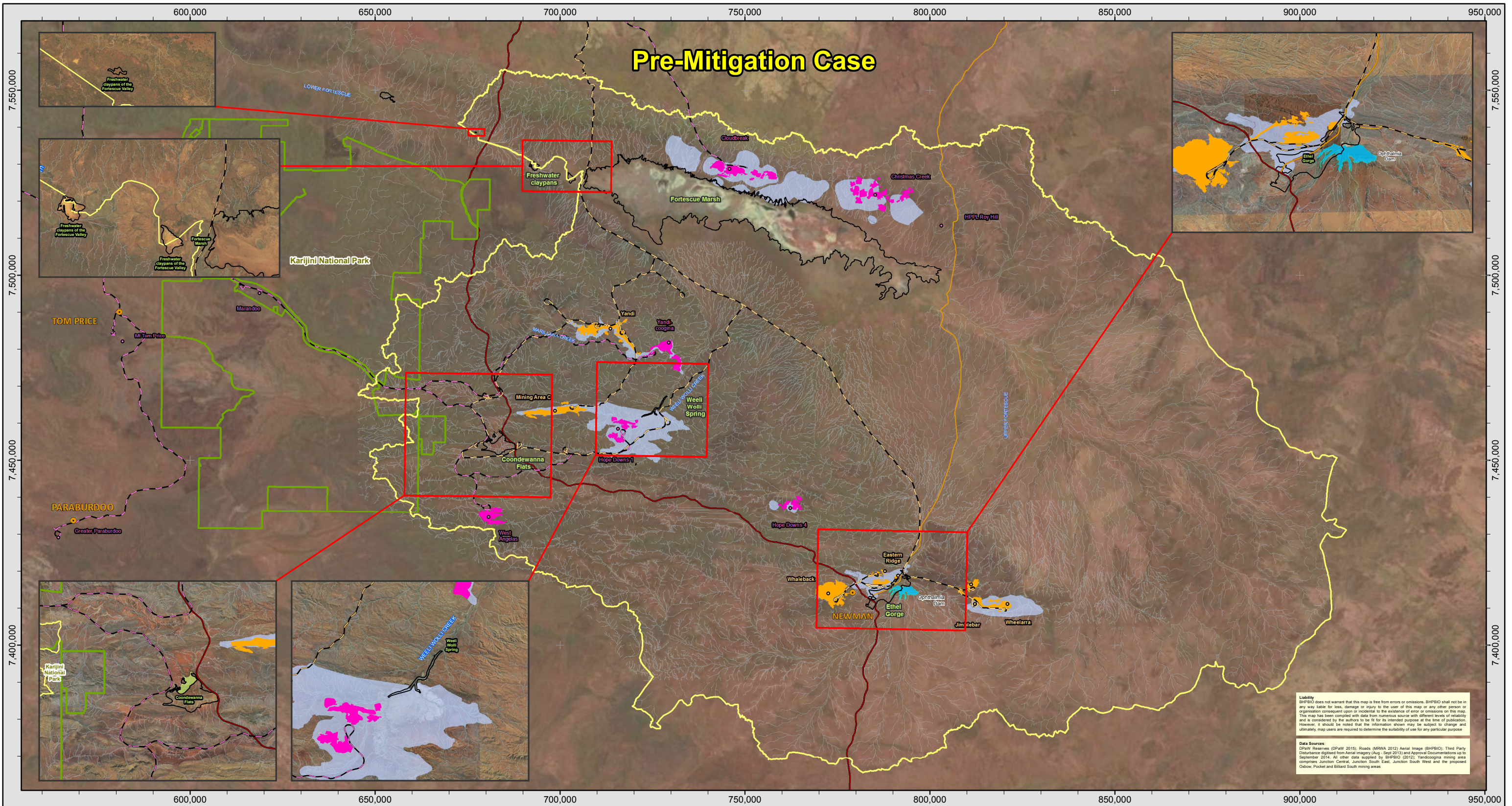
Resource Planning Hydrology
 BHP BILLITON IRON ORE

resourcing the future

ECOHYDROLOGICAL CHANGE ASSESSMENT
 Location of Generic Mine Types - BHP Billiton Iron Ore

Coordinate System: GDA 1994 MGA Zone 50
 Projection: Transverse Mercator, Datum: GDA 1994, Units: Meter

Scale @ A3: 1:1,000,000	Prepared: J Botterill	Revision: Rev L
Date: 15/04/2015	Checked: J Vermaak	Map: 19
	Reviewed: R Wright	



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Data Sources:
DPAW Reserves (DPAW 2015); Roads (MRWA 2012); Aerial Image (BHPBIO); Third Party Disturbance digitised from Aerial Imagery (Aug - Sept 2013) and Approval Documentations up to September 2014. All other data supplied by BHPBIO (2012). Yandi/coogina mining area comprises Junction Central, Junction South East, Junction South West and the proposed Ochoo, Picket and Billard South mining areas.

LEGEND

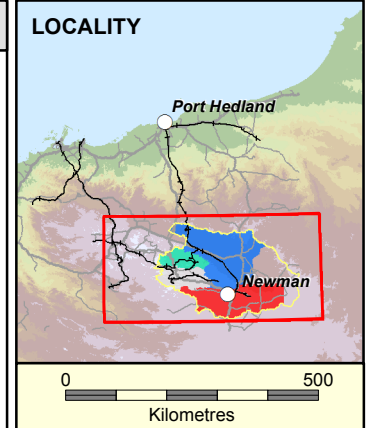
Ecohydrology Study Boundary	BHPBIO Mining Areas	BHP Billiton Iron Ore Existing Disturbance
Karijini National Park	Third Party Mining Areas	Third Party Existing Disturbance
Ecohydrological Receptors	BHPBIO Rail Corridor	Groundwater Drawdown >1m
Ophthalmia Dam	Third Party Rail Corridor	Existing BHP Billiton Iron Ore & Third Party
Townships	Great Northern Highway	
	Other Roads	

The content of this map is conceptual only, of a general nature and does not purport to contain all information relevant to future project development associated with the Project. This map has been prepared solely for the purposes of informing environmental impact assessment pursuant to the Environmental Protection Act 1986 (WA) and Environment Protection and Biodiversity Conservation Act 1999 and is not intended for use for any other purpose. No representation or warranty is given that project development associated with any or all of the disturbance indicated on this map will actually proceed. As project development is dependent upon future events, the outcome of which is uncertain and cannot be assured, actual development may vary materially from this conceptual map.

Notes: Pre-mitigation groundwater changes

BHP Billiton Iron Ore assessment based on:
Analytical assessment
No recharge
No groundwater recovery after closure, pits remain open after closure
No infiltration from Ophthalmia Dam
No irrigation at Weeli Wollil Springs

Third Parties assessment based on:
Davidson Creek (only 10m drawdown contour provided)
Most of Koodaideri, Iron Valley and Lamb Creek are above the water table
Drawdown extents for third parties obtained from public documents
The drawdown extent at Hope Downs 1 was based on the Central Pilbara Groundwater Study (Johnson and Wright, 2001)
No groundwater recovery after closure



Resource Planning Hydrology
BHP BILLITON IRON ORE

ECOHYDROLOGICAL CHANGE ASSESSMENT
Groundwater Change
Cumulative - Existing Development

0 10 20 40 60 Kilometres
Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator, Datum: GDA 1994, Units: Meter

Scale @ A3: 1:1,000,000	Prepared: J Botterill	Revision: Rev K
Date: 15/04/2015	Checked: J Vermaak	Map: 20
	Reviewed: J Youngs	