

Water entitlement market prices

Murray–Darling Basin

(October 2016)

Prepared for Australian Government Department of Agriculture and Water Resources

MARSDEN JACOB ASSOCIATES

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Introduction

This October 2016 monthly water entitlement market prices report has been prepared by Marsden Jacob Associates (Marsden Jacob) for the Australian Government Department of Agriculture and Water Resources.

A water access entitlement is a perpetual or ongoing entitlement to exclusive access to a share of water from a specified consumptive pool, as defined in the relevant water plan.

The report includes:

- southern Murray–Darling Basin (MDB) market activity and price information, by region and entitlement type
- northern MDB market activity and price information, by region and entitlement type
- a list of catchments and water sources
- a list of data outliers removed from the trade data

Regions, entitlements and key statistics

The entitlement price report is broadly split into the southern and the northern MDB, as detailed in Table 1 and Table 2. Interactive maps showing the location of these trading regions are available on the Murray–Darling Basin Authority's website.

The water sources included in each of the regions are listed in Appendix A.

Table 1: Regions and entitlement types, southern MDB

Region	Entitlement type
SA Murray	Class 3a
Vic. Murray above Barmah Choke	High reliability
Vic. Murray above Barmah Choke	Low reliability
Vic. Murray below Barmah Choke	High reliability
Vic. Murray below Barmah Choke	Low reliability
Goulburn	High reliability
Goulburn	Low reliability
Campaspe	High reliability
Loddon	High reliability
NSW Murray	General security
NSW Murray	High security
NSW Murray Irrigation Limited	General security
Murrumbidgee	General security
Murrumbidgee	High security
Lower Darling	General security
Lower Darling	High security

Table 2: Regions and entitlement types, northern MDB

Region	Entitlement type
Macquarie	General security
Namoi	General security
Gwydir	General security
NSW Border Rivers	General security
Barwon–Darling	Unregulated
Lachlan	General security
Condamine–Balonne (St George)	Supplemented
Condamine–Balonne (Upper Condamine and Lower Balonne)	Unsupplemented
Central Condamine Alluvium Groundwater (1, 2, 3 and 4)	Groundwater (sub areas 1, 2, 3 and 4)
Upper Condamine Alluvium Groundwater (Dalrymple Creek)	Groundwater
Upper Condamine Alluvium Groundwater (Oakey Creek)	Groundwater
Qld Border Rivers	Supplemented
Qld Border Rivers	Unsupplemented
Lower Balonne	Overland flow

As requested by the department, for each of the regions and water entitlement categories Marsden Jacob reports a range of measures, subject to data availability and the number of trades:

- volume weighted average price (VWAP)
- median price
- mean price
- mode price
- 25th and 75th percentile prices
- price quintiles
- trade volume
- number of trades
- water trading exchange prices.

Data sources

The data sources for this report are:

- National Water Market Register data, up to 31 December 2013
- state government water registers and websites

- water exchange and broker noticeboard prices.

Notes

Entitlement prices in the state government water registers can lag the exchange date of contracts or water sale agreements by periods of days to several months. This means the entitlement prices shown in the monthly and quarterly VWAPs may not reflect all exchanges during the month.

Entitlement prices that do not appear to reflect arm's-length transactions have been excluded in the data cleaning process (see Appendix B).

Removing these values reduces price distortions in the reporting. This means prices in this report may differ from prices shown in registers where these transactions have not been removed.

Marsden Jacob uses a two-stage process to clean the data:

1. Removing prices that may not be genuine; for example, removing transactions where the price was reported to be null (\$0 per ML)
2. Reviewing and potentially removing transactions outside two standard deviations from the average price of water entitlements by region (or trading zone) and by water product.

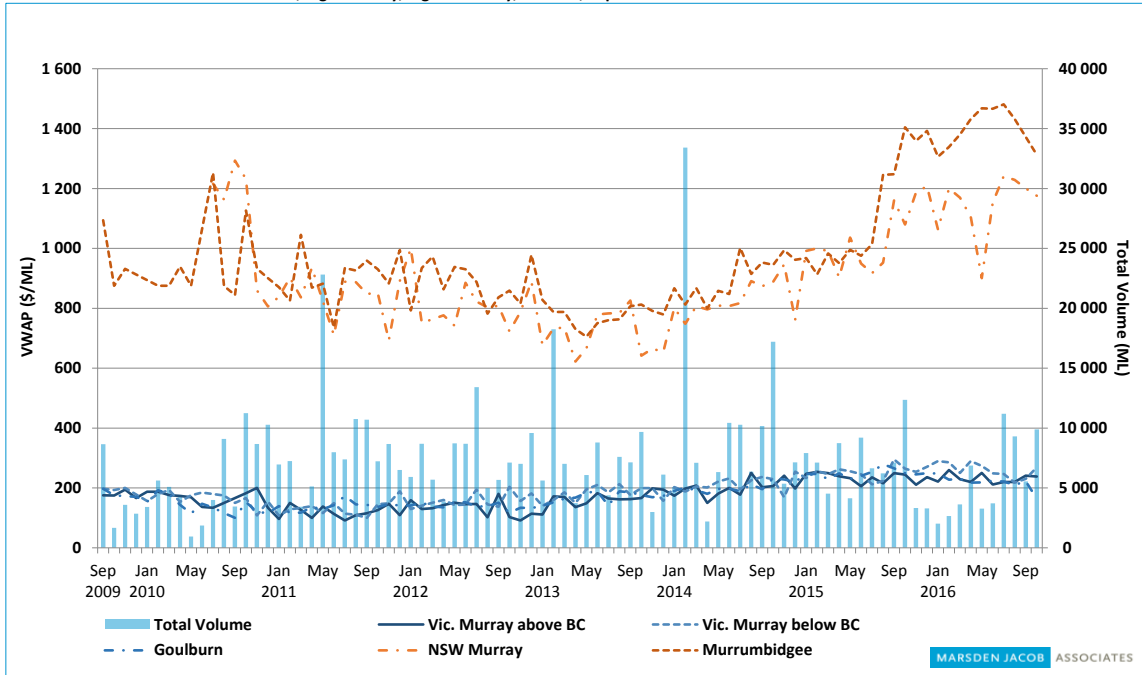
Marsden Jacob does not necessarily remove all trades that fall outside two standard deviations, as some of them reflect arm's-length trades. If trades that fall outside two standard deviations are retained in the regional dataset, this is noted in the region- and entitlement-specific reports, as well as Appendix B. Also, trades that fall within two standard deviations but are removed because they are not considered representative on the basis of recent data trends are also noted in the region- and entitlement-specific reports, as well as Appendix B.

Water entitlement market prices Murray–Darling Basin (October 2016)

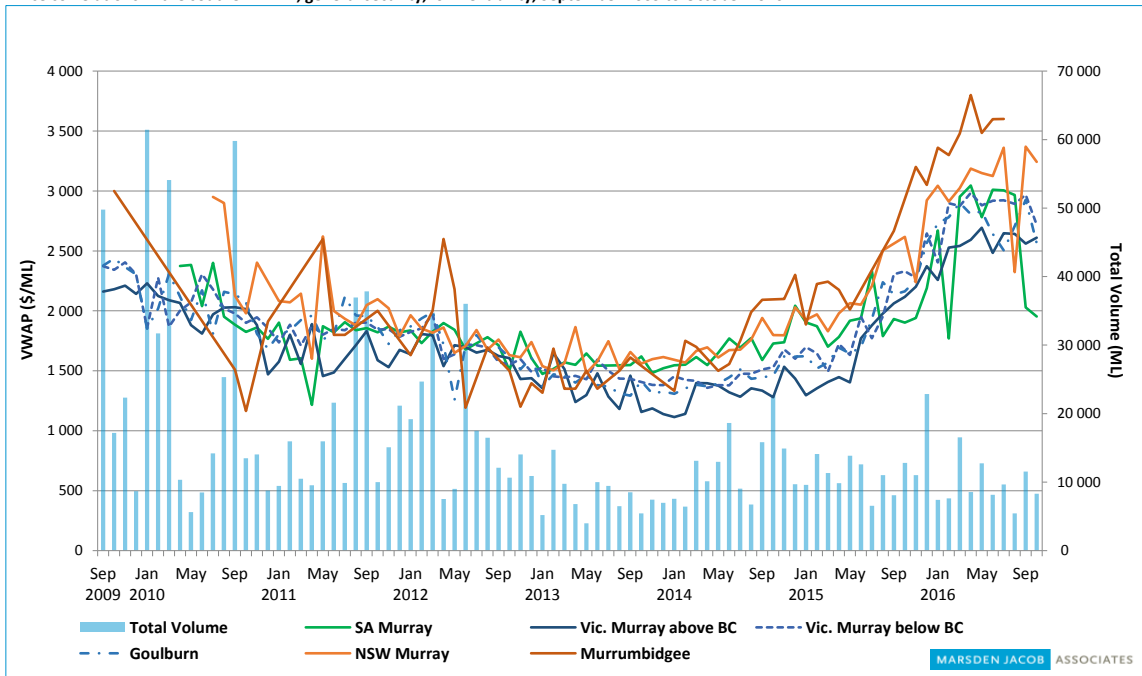
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Southern Murray–Darling Basin

Price correlations in the southern MDB, high security, high reliability, Class 3a, September 2009 to October 2016



Price correlations in the southern MDB, general security, low reliability, September 2009 to October 2016

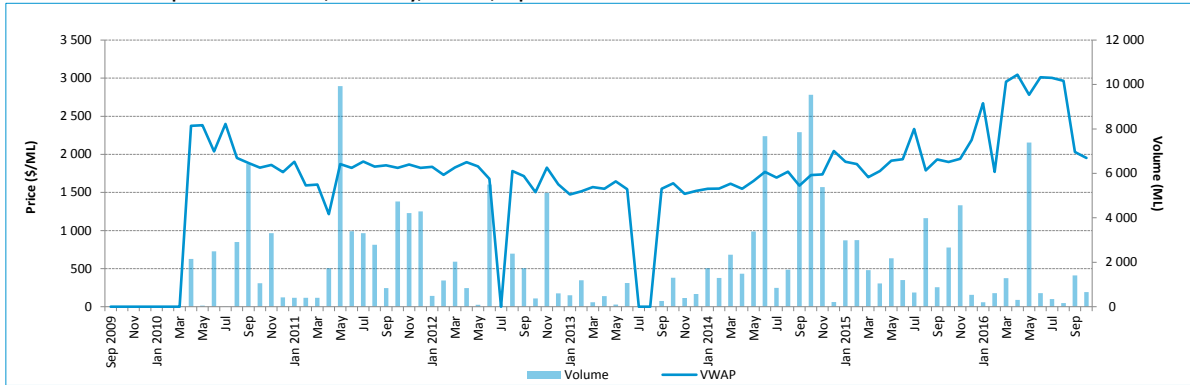


Source: Marsden Jacob analysis, 2016.

Water entitlement market prices Murray–Darling Basin (October 2016)

Southern Australian Murray: Class 3a

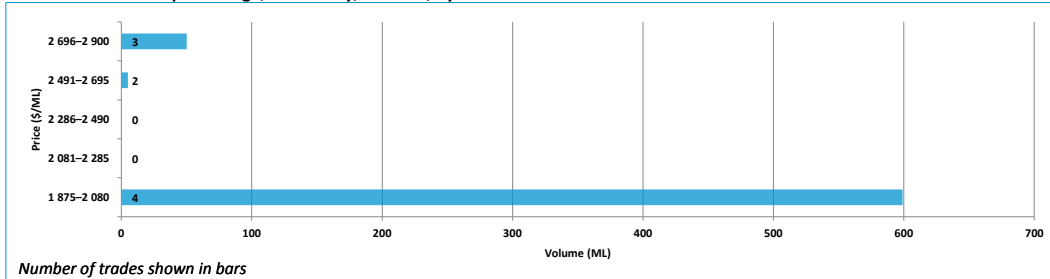
Entitlement market prices and volumes, SA Murray, Class 3a, September 2009 to October 2016



Entitlement market prices and volumes, SA Murray, Class 3a

Volume weighted average price (\$/ML)		October 2016 (in \$/ML)						October 2016	October 2016 #	Broker buy/sell
Month of	October 2016	YTD	25th percentile	75th percentile	Median	Mean	Mode	Volume	of trades	range (\$/ML)
October 2016	Quarter									
1 953	2 075	2 458	1 875	2 800	2 600	2 361	1 875	654	9	2 500 - 3 000

Entitlement market price range, SA Murray, Class 3a, by volume October month 2016

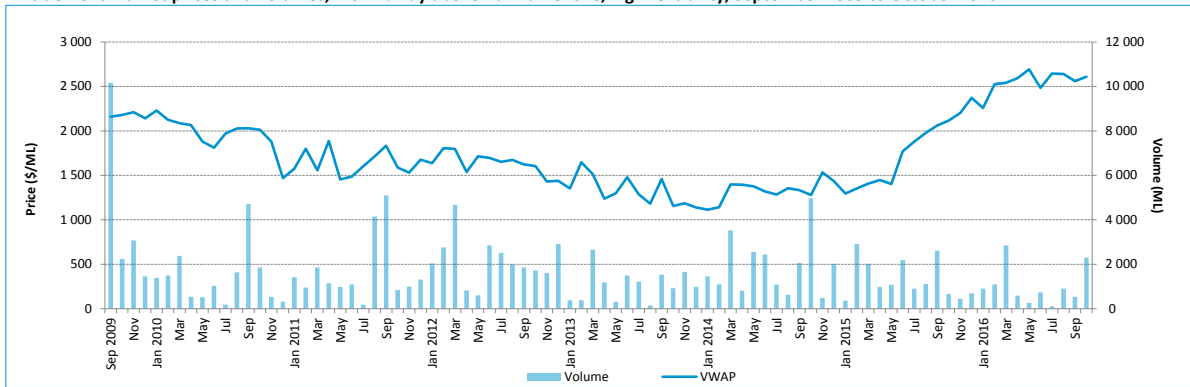


Number of trades shown in bars

Water entitlement market prices Murray-Darling Basin (October 2016)

Victorian Murray above Barmah Choke: high reliability

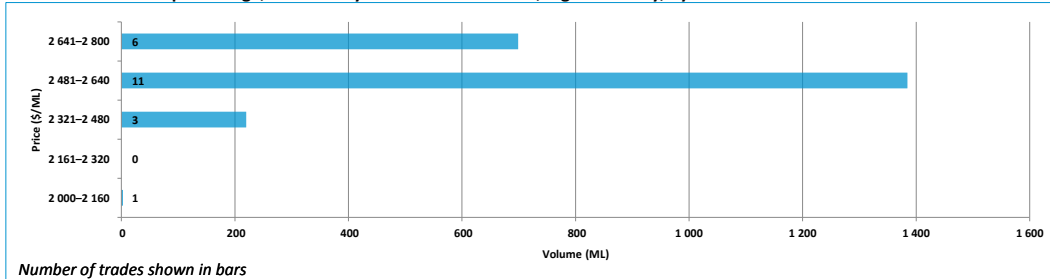
Entitlement market prices and volumes, Vic. Murray above Barmah Choke, high reliability, September 2009 to October 2016



Entitlement market prices and volumes, Vic. Murray above Barmah Choke, high reliability

Volume weighted average price (\$/ML)		October 2016 (in \$/ML)					October 2016	October 2016 #	Broker buy/sell	
Month of	October 2016	YTD	25th percentile	75th percentile	Median	Mean	Mode	Volume	of trades	range (\$/ML)
October 2016	Quarter									
2 610	2 611	2 520	2 500	2 650	2 600	2 560	2 600	2 306	21	2 300 - 2 650

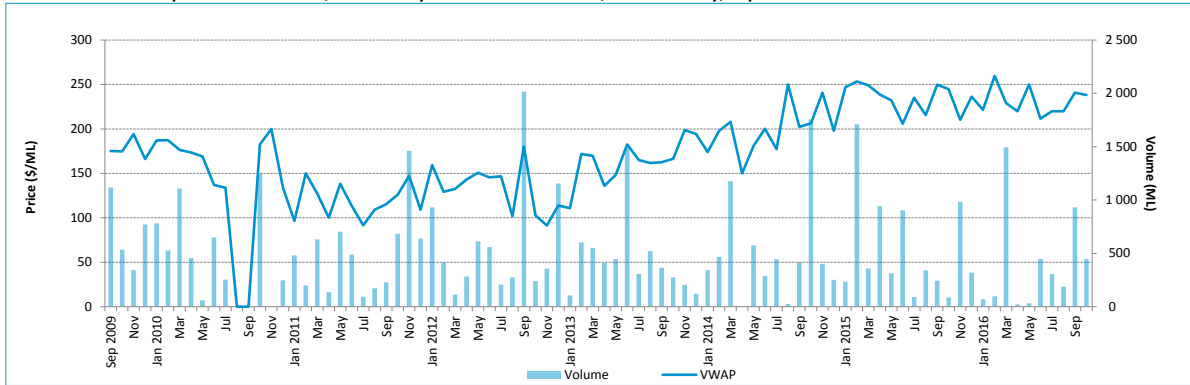
Entitlement market price range, Vic. Murray above Barmah Choke, high reliability, by volume October month 2016



Water entitlement market prices Murray–Darling Basin (October 2016)

Victorian Murray above Barmah Choke: low reliability

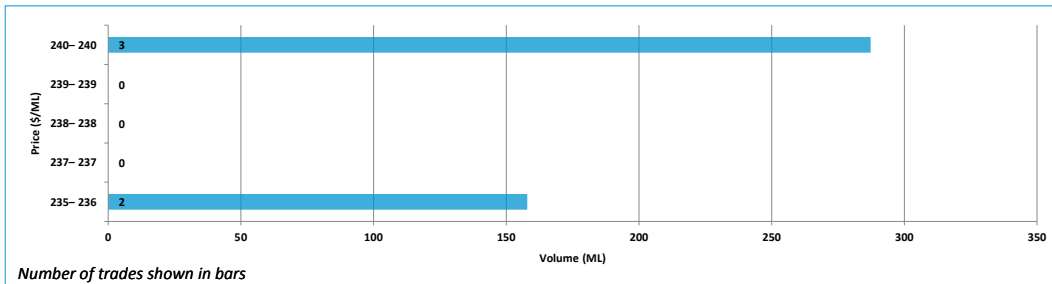
Entitlement market prices and volumes, Vic. Murray above Barmah Choke, low reliability, September 2009 to October 2016



Entitlement market prices and volumes, Vic. Murray above Barmah Choke, low reliability

Volume weighted average price (\$/ML)		October 2016 (in \$/ML)					October 2016	October 2016 #	Broker buy/sell	
Month of	October 2016	YTD	25th percentile	75th percentile	Median	Mean	Mode	Volume	of trades	range (\$/ML)
October 2016	Quarter									
238	238	227	235	240	240	238	240	445	5	225 - 275

Entitlement market price range, Vic. Murray above Barmah Choke, low reliability, by volume October month 2016



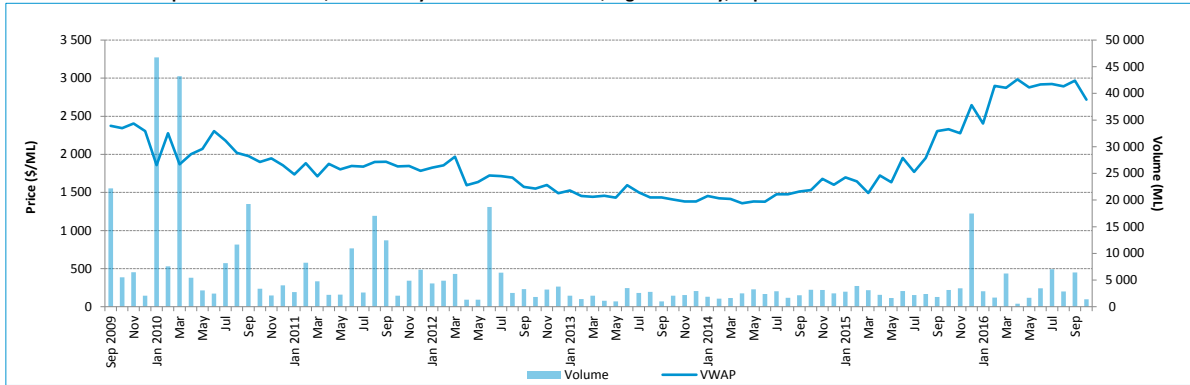
Number of trades shown in bars

Note: One trade which is inside two standard deviations of the average price of water entitlements has been excluded for this region.

Water entitlement market prices Murray-Darling Basin (October 2016)

Victorian Murray below Barmah Choke: high reliability

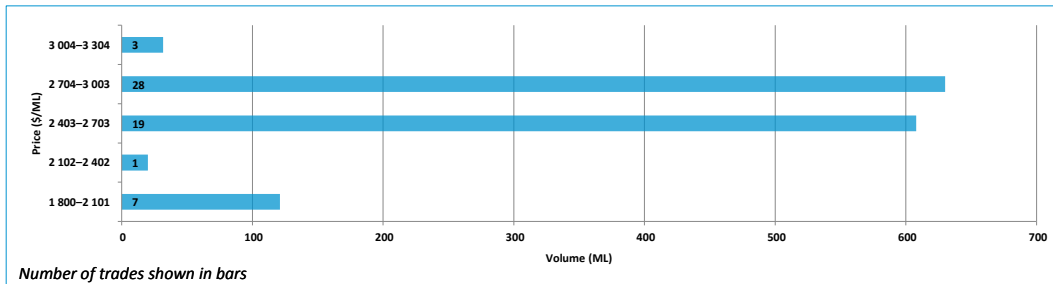
Entitlement market prices and volumes, Vic. Murray below Barmah Choke, high reliability, September 2009 to October 2016



Entitlement market prices and volumes, Vic. Murray below Barmah Choke, high reliability

Volume weighted average price (\$/ML)		October 2016 (in \$/ML)					October 2016	October 2016 #	Broker buy/sell	
Month of	October 2016	YTD	25th percentile	75th percentile	Median	Mean	Mode	Volume	of trades	range (\$/ML)
October 2016	Quarter									
2 717	2 915	2 758	2 500	2 850	2 763	2 673	2 500	1 411	58	2 500 - 3 000

Entitlement market price range, Vic. Murray below Barmah Choke, high reliability, by volume October month 2016

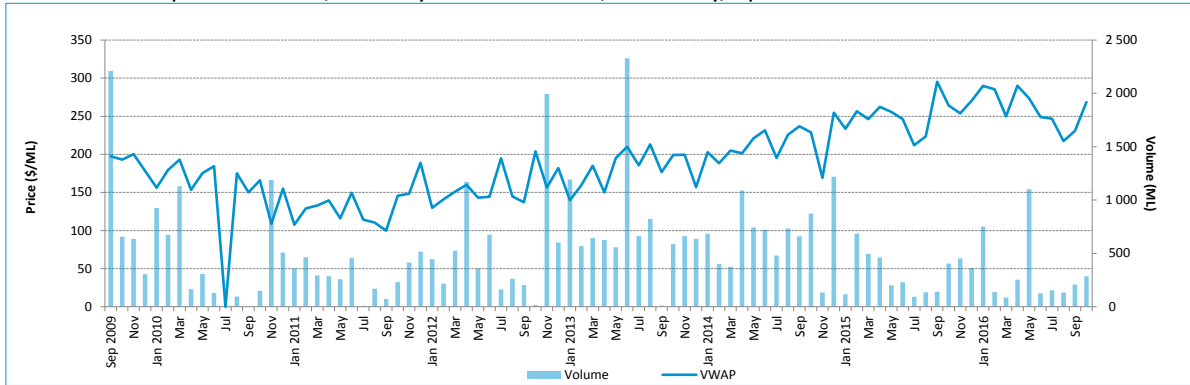


Number of trades shown in bars

Water entitlement market prices Murray-Darling Basin (October 2016)

Victorian Murray below Barmah Choke: low reliability

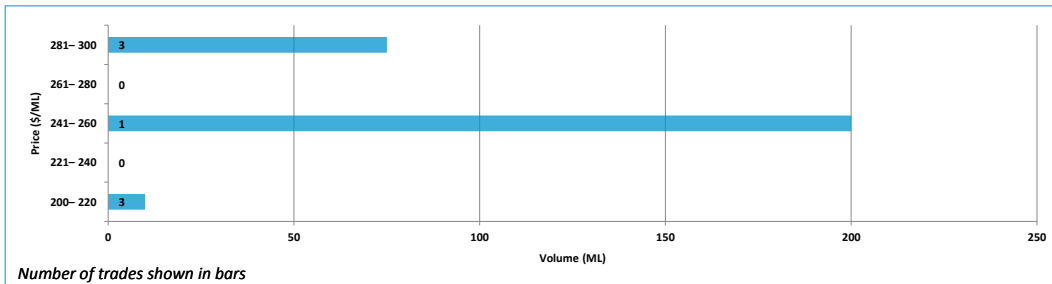
Entitlement market prices and volumes, Vic. Murray below Barmah Choke, low reliability, September 2009 to October 2016



Entitlement market prices and volumes, Vic. Murray below Barmah Choke, low reliability

Volume weighted average price (\$/ML)		October 2016 (in \$/ML)						October 2016	October 2016 #	Broker buy/sell
Month of	October 2016	YTD	25th percentile	75th percentile	Median	Mean	Mode	Volume	of trades	range (\$/ML)
October 2016	Quarter									
268	245	269	200	300	260	251	300	285	7	240 - 275

Entitlement market price range, Vic. Murray below Barmah Choke, low reliability, by volume October month 2016



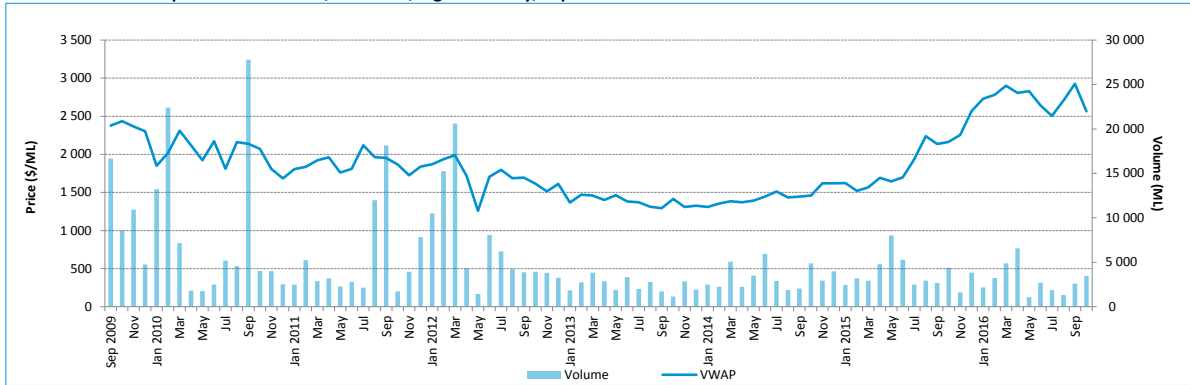
Number of trades shown in bars

Note: Three trades which is outside two standard deviations of the average price of water entitlements has been included for this region.

Water entitlement market prices Murray-Darling Basin (October 2016)

Goulburn: high reliability

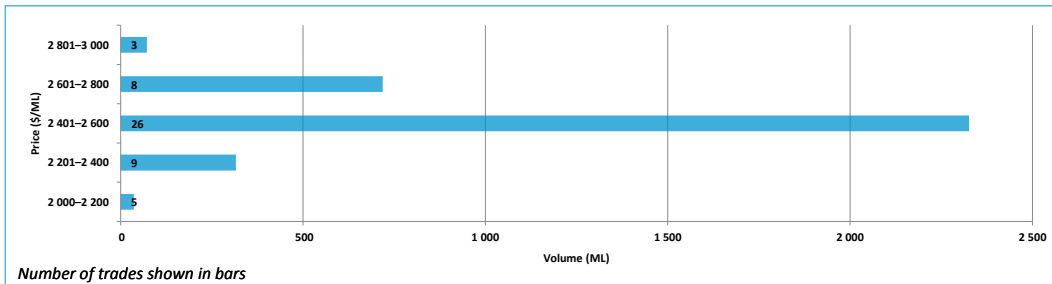
Entitlement market prices and volumes, Goulburn, high reliability, September 2009 to October 2016



Entitlement market prices and volumes, Goulburn, high reliability

Volume weighted average price (\$/ML)		October 2016 (in \$/ML)					October 2016	October 2016 #	Broker buy/sell	
Month of	October 2016	YTD	25th percentile	75th percentile	Median	Mean	Mode	Volume	of trades	range (\$/ML)
October 2016	Quarter									
2 564	2 717	2 715	2 400	2 600	2 550	2 520	2 600	3 468	51	2 400 - 2 700

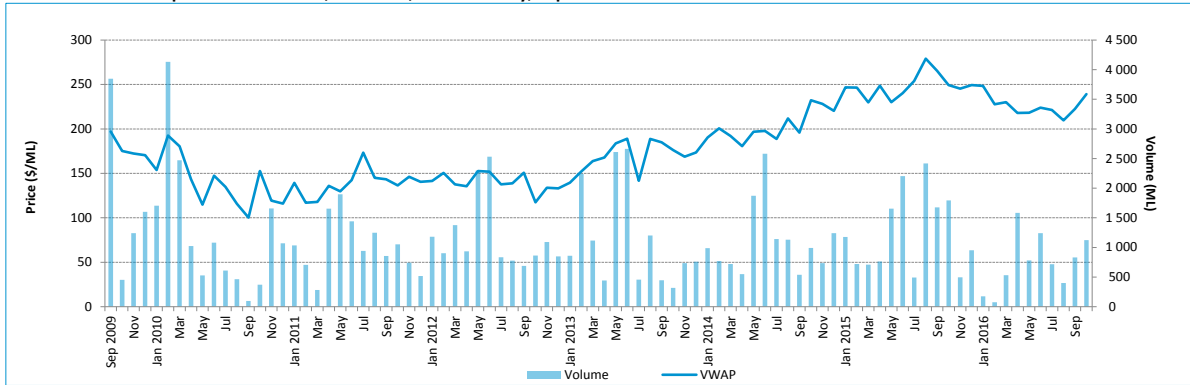
Entitlement market price range, Goulburn, high reliability, by volume October month 2016



Water entitlement market prices Murray-Darling Basin (October 2016)

Goulburn: low reliability

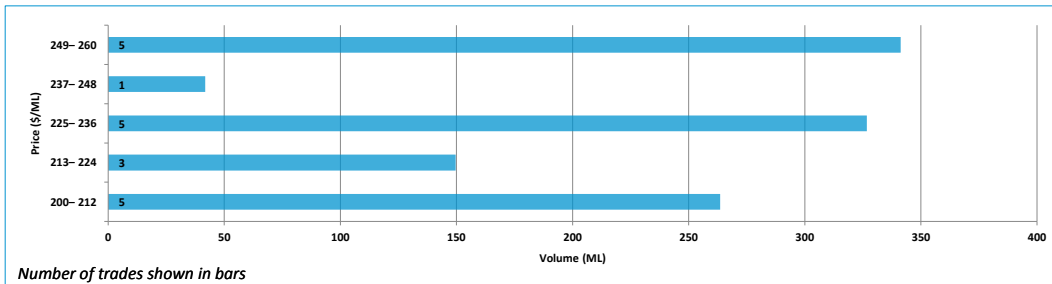
Entitlement market prices and volumes, Goulburn, low reliability, September 2009 to October 2016



Entitlement market prices and volumes, Goulburn, low reliability

Volume weighted average price (\$/ML)		October 2016 (in \$/ML)						October 2016	October 2016 #	Broker buy/sell
Month of	October 2016	YTD	25th percentile	75th percentile	Median	Mean	Mode	Volume	of trades	range (\$/ML)
October 2016	Quarter									
239	228	228	205	248	225	227	200	1 123	19	230 - 275

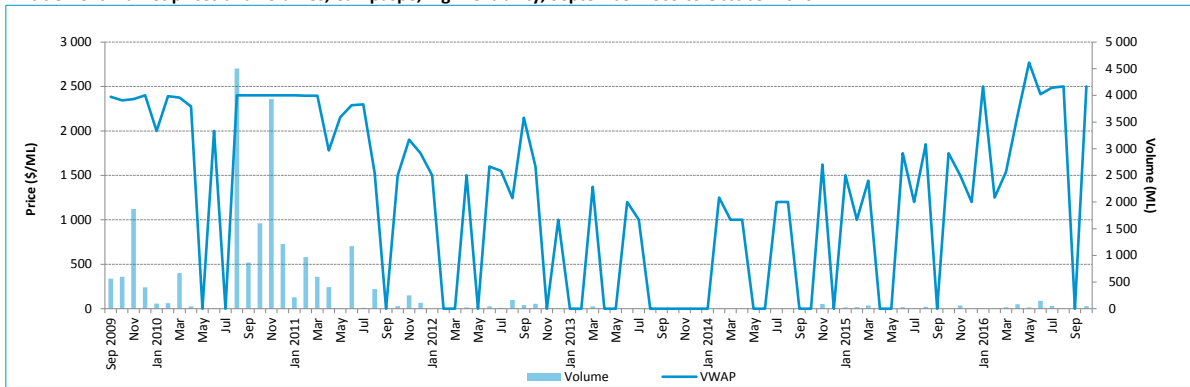
Entitlement market price range, Goulburn, low reliability, by volume October month 2016



Water entitlement market prices Murray-Darling Basin (October 2016)

Campaspe: high reliability

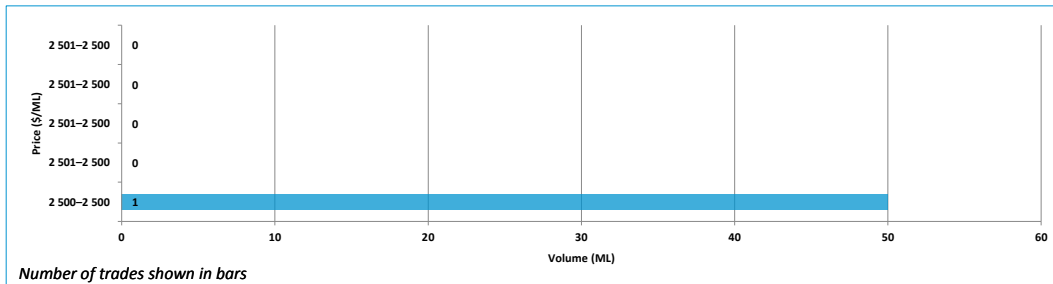
Entitlement market prices and volumes, Campaspe, high reliability, September 2009 to October 2016



Entitlement market prices and volumes, Campaspe, high reliability

Volume weighted average price (\$/ML)		October 2016 (in \$/ML)					October 2016	October 2016 #	Broker buy/sell	
Month of	October 2016	YTD	25th percentile	75th percentile	Median	Mean	Mode	Volume	of trades	range (\$/ML)
October 2016	Quarter									
2 500	2 500	2 213	2 500	2 500	2 500	2 500	-	50	1	2 400 - 2 800

Entitlement market price range, Campaspe, high reliability, by volume October month 2016

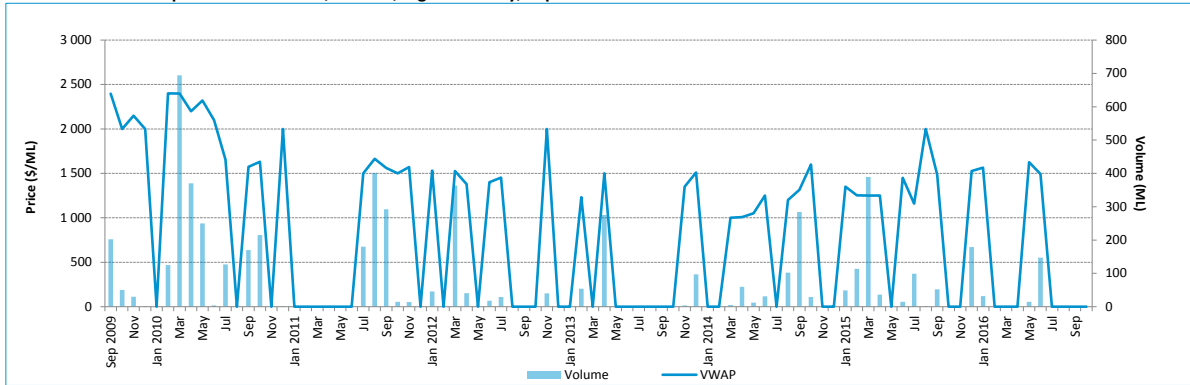


Number of trades shown in bars

Water entitlement market prices Murray-Darling Basin (October 2016)

Loddon: high reliability

Entitlement market prices and volumes, Loddon, high reliability, September 2009 to October 2016



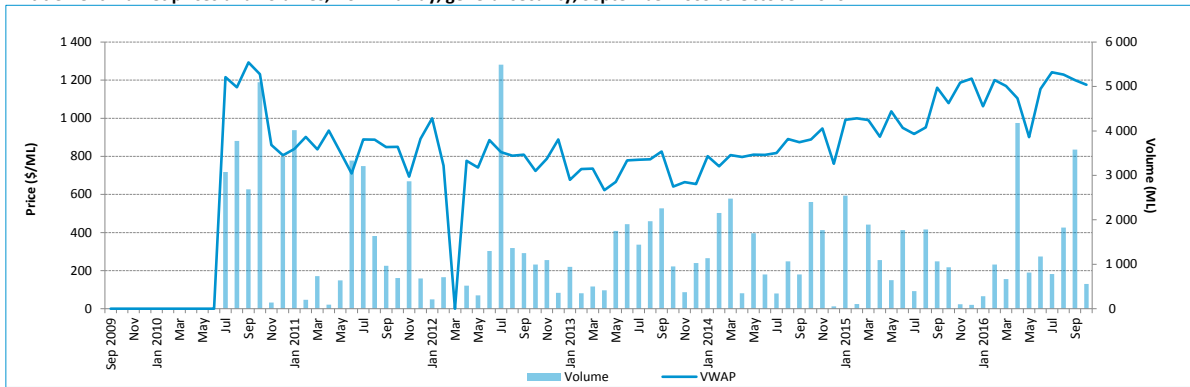
Entitlement market prices and volumes, Loddon, high reliability

Volume weighted average price (\$/ML)		October 2016 (in \$/ML)					October 2016	October 2016 #	Broker buy/sell	
Month of	October 2016	YTD	25th percentile	75th percentile	Median	Mean	Mode	Volume	of trades	range (\$/ML)
October 2016	Quarter									
-	-	1 520	-	-	-	-	-	-	-	No listings

Water entitlement market prices Murray–Darling Basin (October 2016)

New South Wales Murray: general security

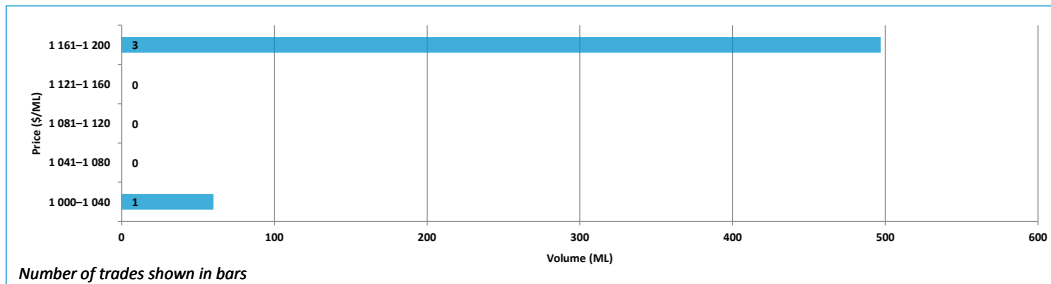
Entitlement market prices and volumes, NSW Murray, general security, September 2009 to October 2016



Entitlement market prices and volumes, NSW Murray, general security

Volume weighted average price (\$/ML)		October 2016 (in \$/ML)						October 2016	October 2016 #	Broker buy/sell
Month of	October 2016	YTD	25th percentile	75th percentile	Median	Mean	Mode	Volume	of trades	range (\$/ML)
October 2016	Quarter									
1 176	1 207	1 155	1 131	1 200	1 188	1 144	1 200	557	4	1 100 - 1 300

Entitlement market price range, NSW Murray, general security, by volume October month 2016

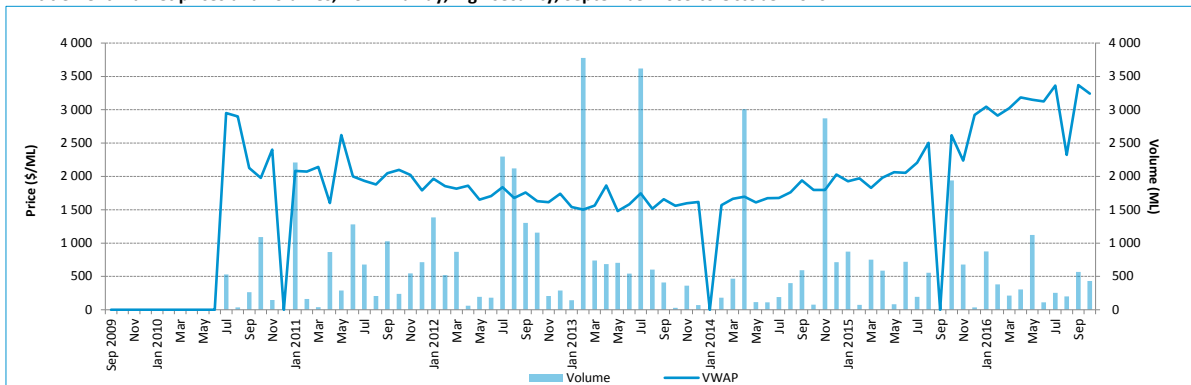


Note: One trade which is outside two standard deviations of the average price of water entitlements has been included for this region.

Water entitlement market prices Murray–Darling Basin (October 2016)

New South Wales Murray: high security

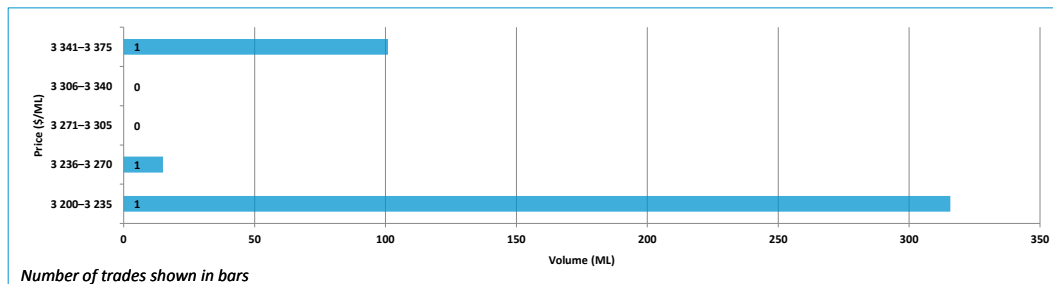
Entitlement market prices and volumes, NSW Murray, high security, September 2009 to October 2016



Entitlement market prices and volumes, NSW Murray, high security

Volume weighted average price (\$/ML)		October 2016 (in \$/ML)					October 2016	October 2016 #	Broker buy/sell	
Month of	October 2016	YTD	25th percentile	75th percentile	Median	Mean	Mode	Volume	of trades	range (\$/ML)
October 2016	Quarter									
3 243	3 150	3 000	3 225	3 313	3 250	3 275	-	432	3	3 100 - 3 400

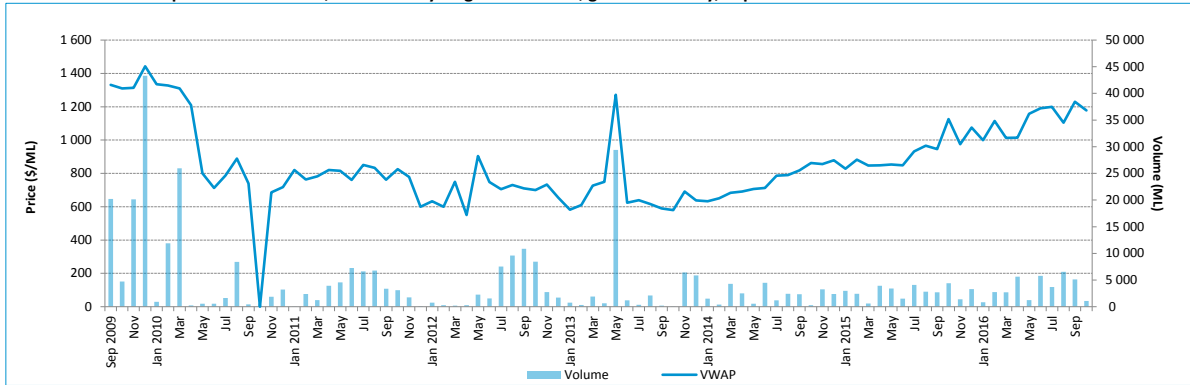
Entitlement market price range, NSW Murray, high security, by volume October month 2016



Water entitlement market prices Murray–Darling Basin (October 2016)

New South Wales Murray Irrigation Limited

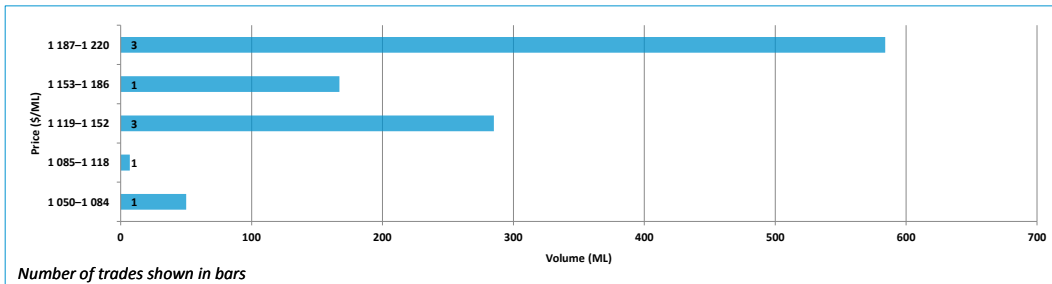
Entitlement market prices and volumes, NSW Murray Irrigation Limited, general security, September 2009 to October 2016



Entitlement market prices and volumes, NSW Murray Irrigation Limited, general security

Volume weighted average price (\$/ML)		October 2016 (in \$/ML)					October 2016	October 2016 #	Broker buy/sell	
Month of	October 2016	YTD	25th percentile	75th percentile	Median	Mean	Mode	Volume	of trades	range (\$/ML)
October 2016	Quarter									
1 178	1 161	1 118	1 150	1 200	1 150	1 156	1 150	1 093	9	1 100 - 1 300

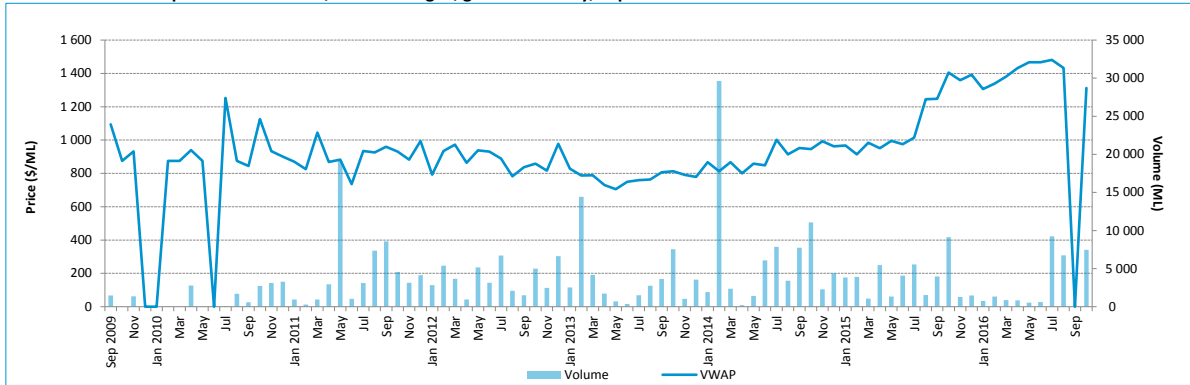
Entitlement market price range, NSW Murray Irrigation Limited, general security, by volume October month 2016



Water entitlement market prices Murray-Darling Basin (October 2016)

Murrumbidgee: general security

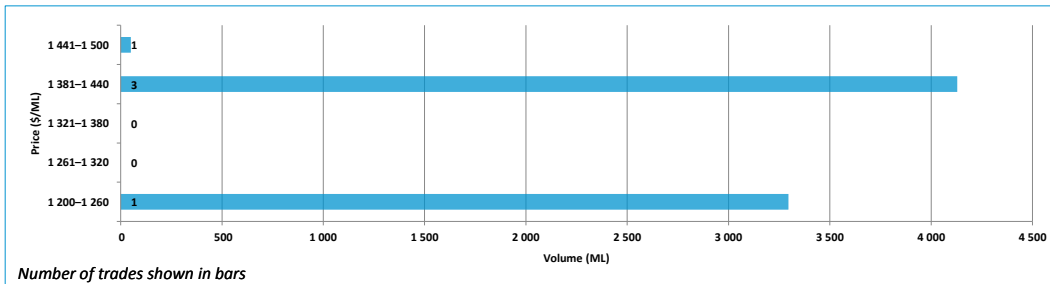
Entitlement market prices and volumes, Murrumbidgee, general security, September 2009 to October 2016



Entitlement market prices and volumes, Murrumbidgee, general security

Volume weighted average price (\$/ML)		October 2016 (in \$/ML)					October 2016	October 2016 #	Broker buy/sell	
Month of	October 2016	YTD	25th percentile	75th percentile	Median	Mean	Mode	Volume	of trades	range (\$/ML)
October 2016	Quarter									
1 312	1 369	1 406	1 400	1 400	1 400	1 380	1 400	7 474	5	1 300 - 1 500

Entitlement market price range, Murrumbidgee, general security, by volume October month 2016



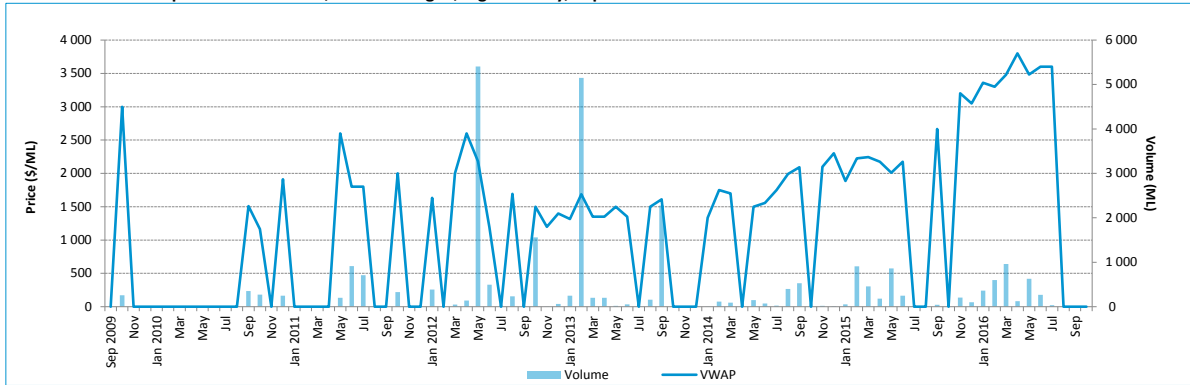
Number of trades shown in bars

Note: One trade which is outside two standard deviations of the average price of water entitlements has been included for this region.

Water entitlement market prices Murray–Darling Basin (October 2016)

Murrumbidgee: high security

Entitlement market prices and volumes, Murrumbidgee, high security, September 2009 to October 2016



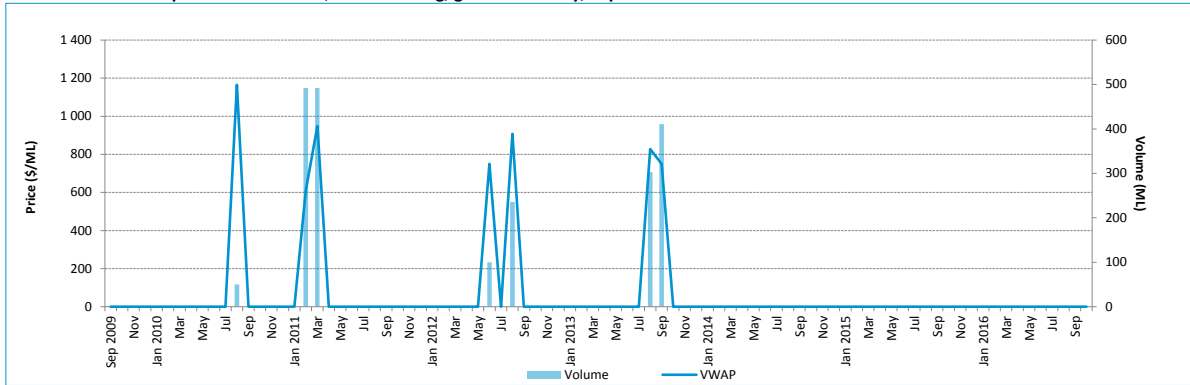
Entitlement market prices and volumes, Murrumbidgee, high security

Volume weighted average price (\$/ML)		October 2016 (in \$/ML)					October 2016	October 2016 #	Broker buy/sell	
Month of	October 2016	YTD	25th percentile	75th percentile	Median	Mean	Mode	Volume	of trades	range (\$/ML)
October 2016	Quarter									
-	-	3 427	-	-	-	-	-	-	-	3 300 - 3 700

Water entitlement market prices Murray–Darling Basin (October 2016)

Lower Darling: general security

Entitlement market prices and volumes, Lower Darling, general security, September 2009 to October 2016



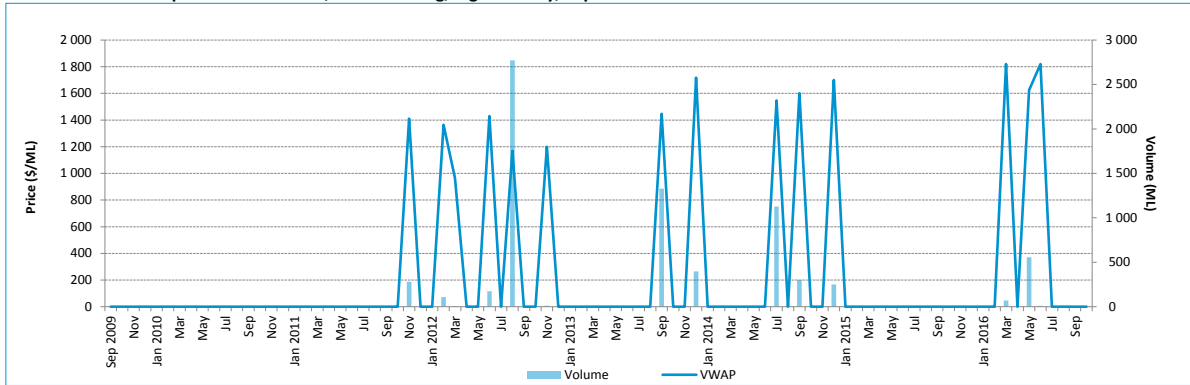
Entitlement market prices and volumes, Lower Darling, general security

Volume weighted average price (\$/ML)		October 2016 (in \$/ML)					October 2016	October 2016 #	Broker buy/sell	
Month of	October 2016	YTD	25th percentile	75th percentile	Median	Mean	Mode	Volume	of trades	range (\$/ML)
October 2016	Quarter									
-	-	-	-	-	-	-	-	-	-	No listings

Water entitlement market prices Murray–Darling Basin (October 2016)

Lower Darling: high security

Entitlement market prices and volumes, Lower Darling, high security, September 2009 to October 2016



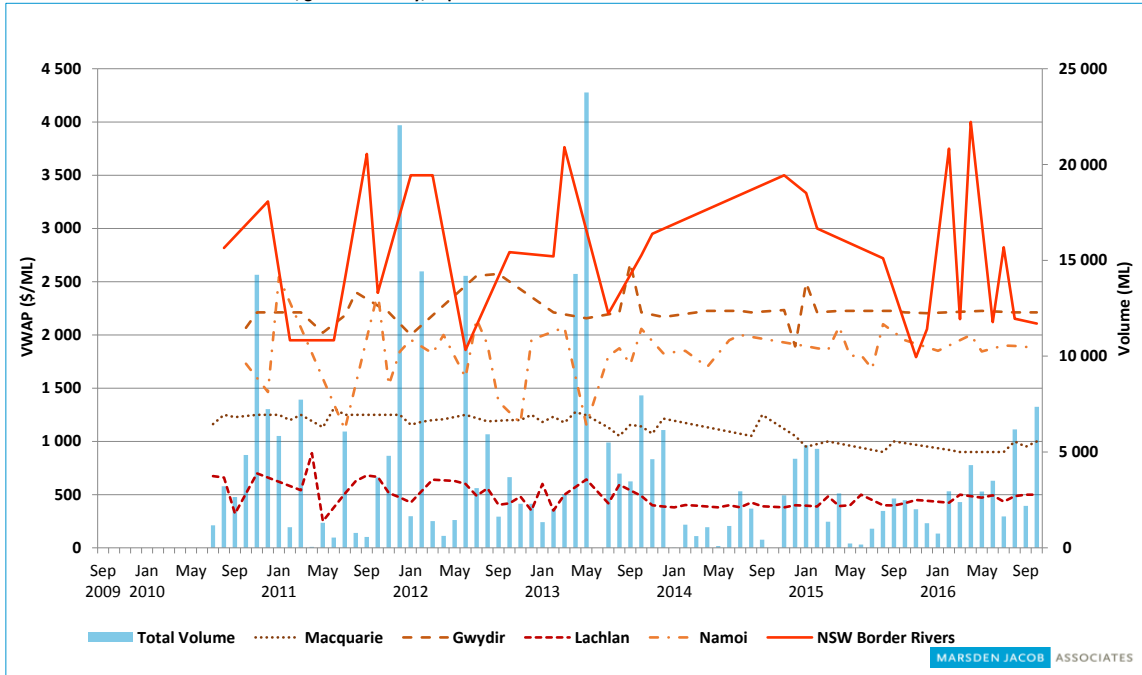
Entitlement market prices and volumes, Lower Darling, high security

Volume weighted average price (\$/ML)			October 2016 (in \$/ML)					October 2016	October 2016 #	Broker buy/sell
Month of	October 2016	YTD	25th percentile	75th percentile	Median	Mean	Mode	Volume	of trades	range (\$/ML)
October 2016	Quarter									
-	-	1 650	-	-	-	-	-	-	-	No listings

Water entitlement market prices Murray–Darling Basin (October 2016)

Northern Murray–Darling Basin

Price correlations in the northern MDB, general security, September 2009 to October 2016



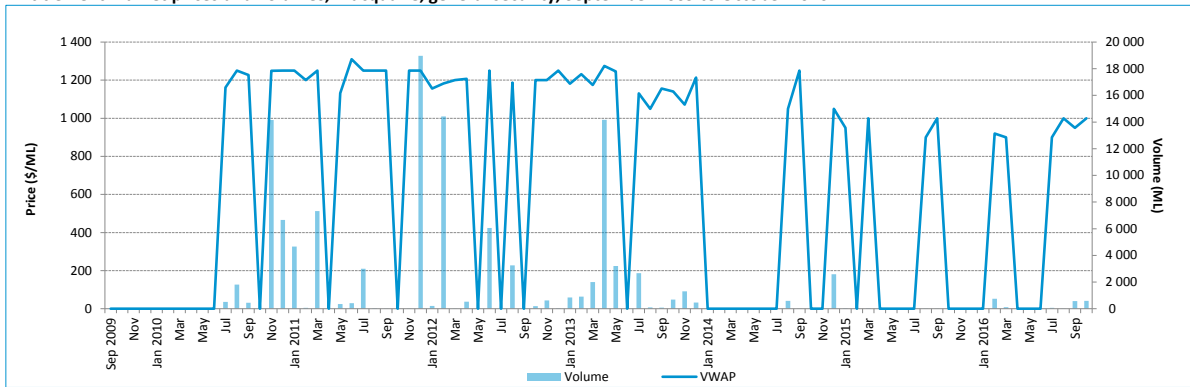
Note: Data only collected from October 2010

Source: Marsden Jacob analysis, 2016.

Water entitlement market prices Murray–Darling Basin (October 2016)

Macquarie: general security

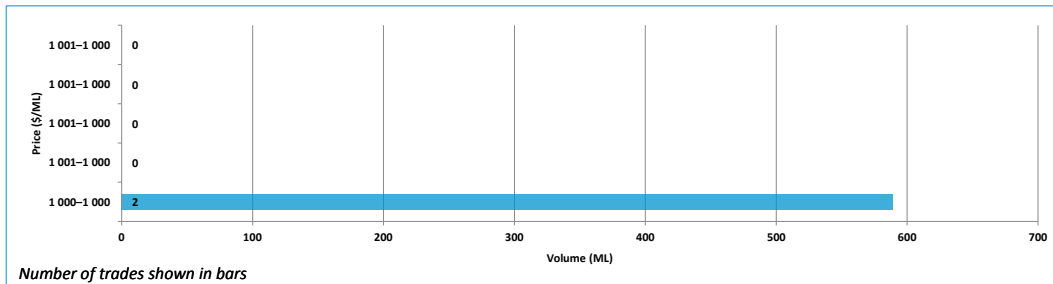
Entitlement market prices and volumes, Macquarie, general security, September 2009 to October 2016



Entitlement market prices and volumes, Macquarie, general security

Volume weighted average price (\$/ML)		October 2016 (in \$/ML)						October 2016	October 2016 #	Broker buy/sell
Month of	October 2016	YTD	25th percentile	75th percentile	Median	Mean	Mode	Volume	of trades	range (\$/ML)
October 2016	Quarter									
1 000	975	949	1 000	1 000	1 000	1 000	1 000	589	2	950 - 1 250

Entitlement market price range, Macquarie, general security, by volume October month 2016

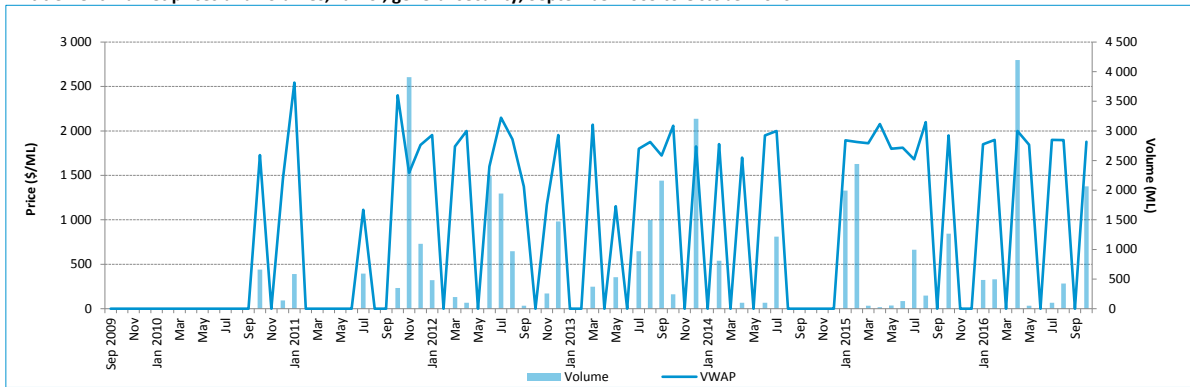


Number of trades shown in bars

Water entitlement market prices Murray-Darling Basin (October 2016)

Namoi: general security

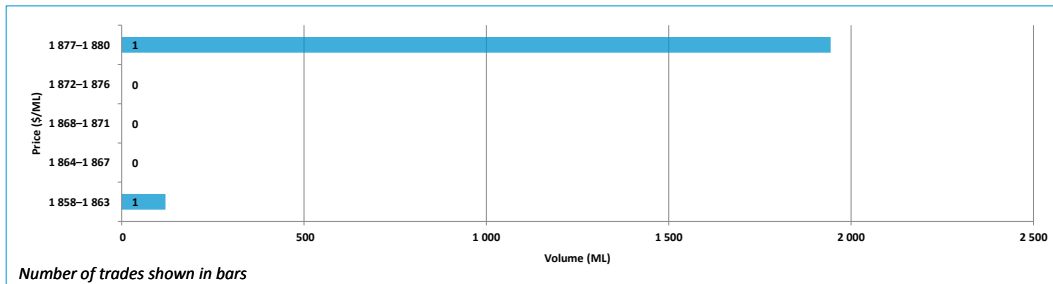
Entitlement market prices and volumes, Namoi, general security, September 2009 to October 2016



Entitlement market prices and volumes, Namoi, general security

Volume weighted average price (\$/ML)		October 2016 (in \$/ML)					October 2016	October 2016 #	Broker buy/sell	
Month of October 2016	October 2016 Quarter	YTD	25th percentile	75th percentile	Median	Mean	Mode	Volume	of trades	range (\$/ML)
1 879	1 882	1 944	1 864	1 875	1 869	1 869	-	2 064	2	1 850 - 2 100

Entitlement market price range, Namoi, general security, by volume October month 2016

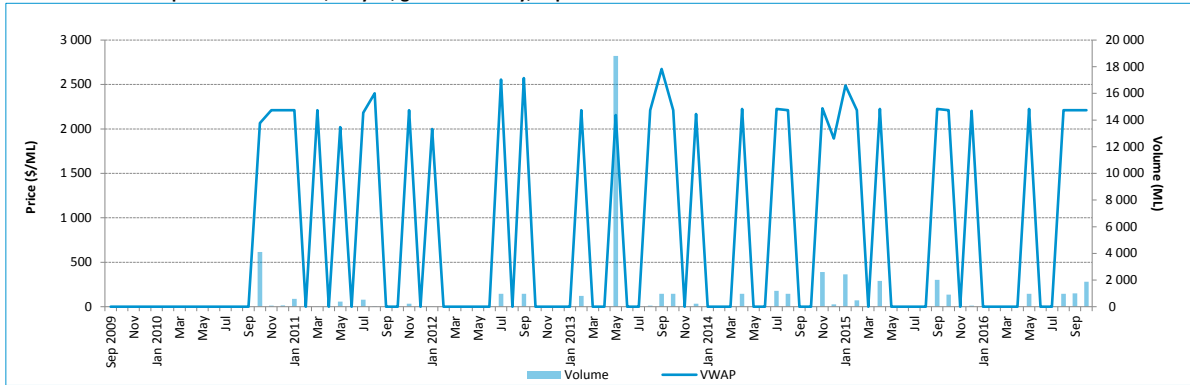


Number of trades shown in bars

Water entitlement market prices Murray-Darling Basin (October 2016)

Gwydir: general security

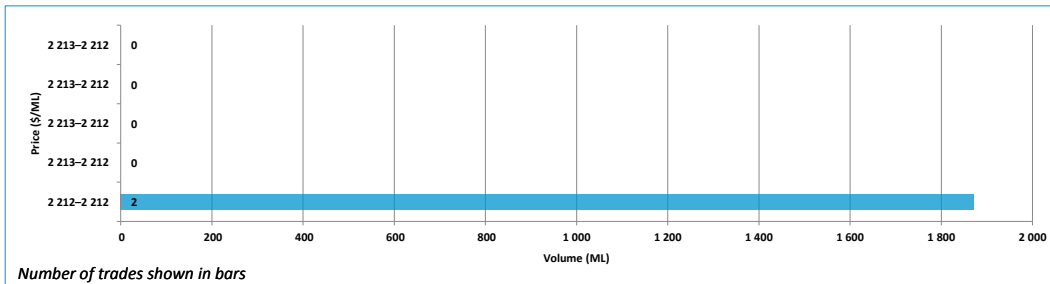
Entitlement market prices and volumes, Gwydir, general security, September 2009 to October 2016



Entitlement market prices and volumes, Gwydir, general security

Volume weighted average price (\$/ML)		October 2016 (in \$/ML)						October 2016	October 2016 #	Broker buy/sell
Month of	October 2016	YTD	25th percentile	75th percentile	Median	Mean	Mode	Volume	of trades	range (\$/ML)
October 2016	Quarter									
2 212	2 212	2 215	2 212	2 212	2 212	2 212	2 212	1 872	2	2 000 - 2 300

Entitlement market price range, Gwydir, general security, by volume October month 2016

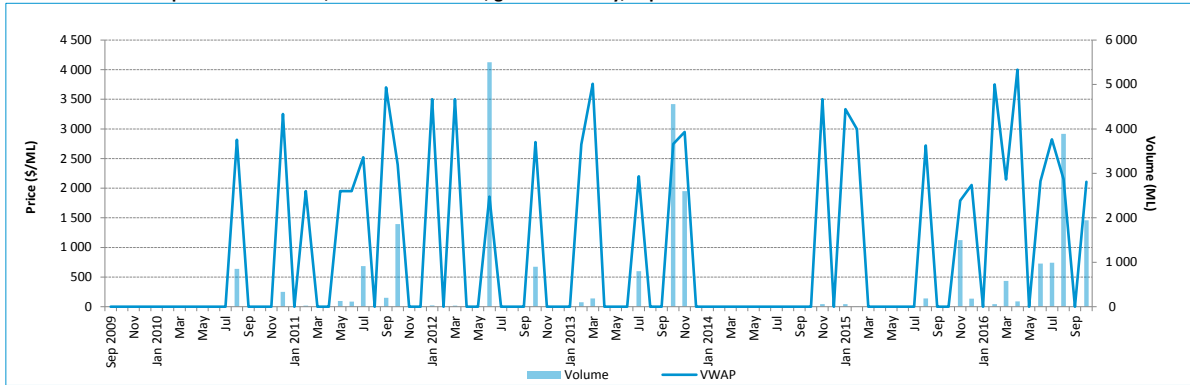


Number of trades shown in bars

Water entitlement market prices Murray-Darling Basin (October 2016)

New South Wales Border Rivers: general security

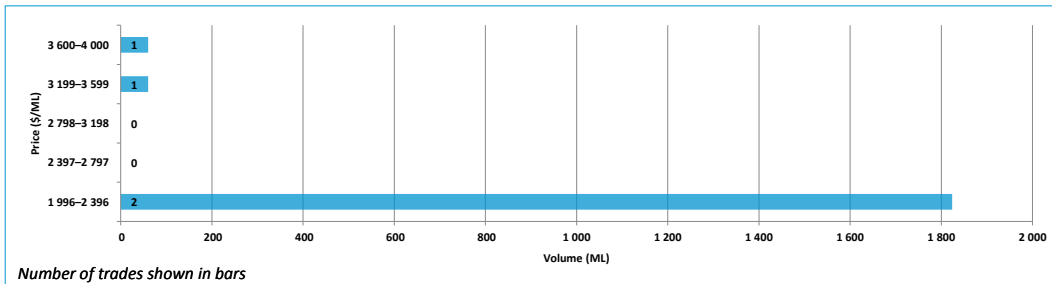
Entitlement market prices and volumes, NSW Border Rivers, general security, September 2009 to October 2016



Entitlement market prices and volumes, NSW Border Rivers, general security

Volume weighted average price (\$/ML)		October 2016 (in \$/ML)					October 2016	October 2016 #	Broker buy/sell	
Month of October 2016	October 2016 Quarter	YTD	25th percentile	75th percentile	Median	Mean	Mode	Volume	of trades	range (\$/ML)
2 106	2 137	2 182	1 999	3 625	2 750	2 874	-	1 944	4	2 000 - 2 500

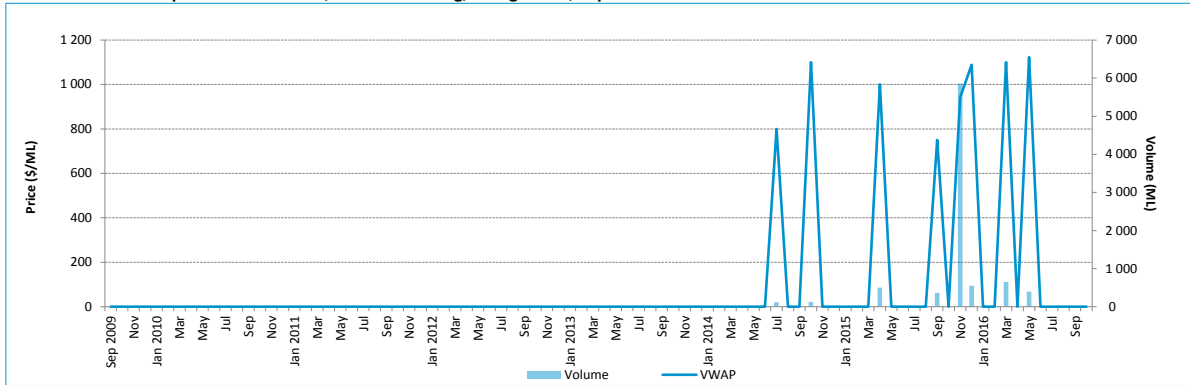
Entitlement market price range, NSW Border Rivers, general security, by volume October month 2016



Water entitlement market prices Murray–Darling Basin (October 2016)

Barwon–Darling: unregulated

Entitlement market prices and volumes, Barwon–Darling, unregulated, September 2009 to October 2016



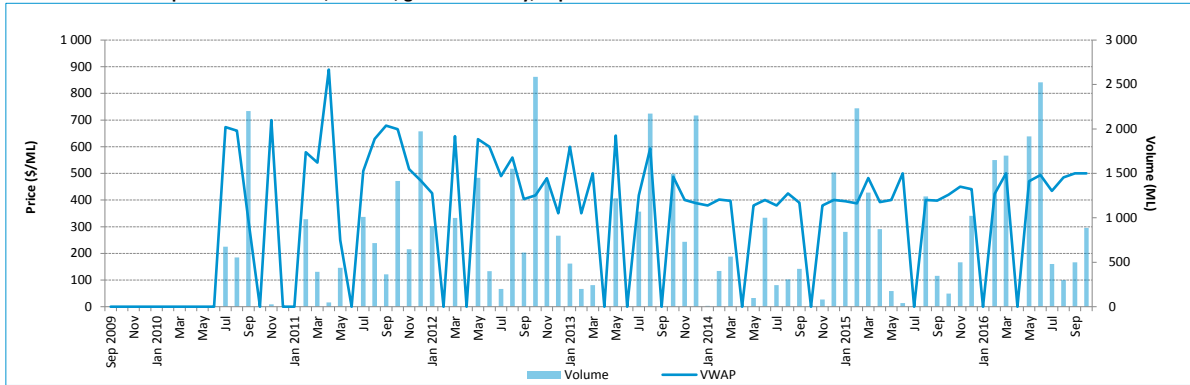
Entitlement market prices and volumes, Barwon–Darling, unregulated

Volume weighted average price (\$/ML)		October 2016 (in \$/ML)					October 2016	October 2016 #	Broker buy/sell	
Month of	October 2016	YTD	25th percentile	75th percentile	Median	Mean	Mode	Volume	of trades	range (\$/ML)
October 2016	Quarter									
-	-	977	-	-	-	-	-	-	-	1 000 - 1 300

Water entitlement market prices Murray–Darling Basin (October 2016)

Lachlan: General security

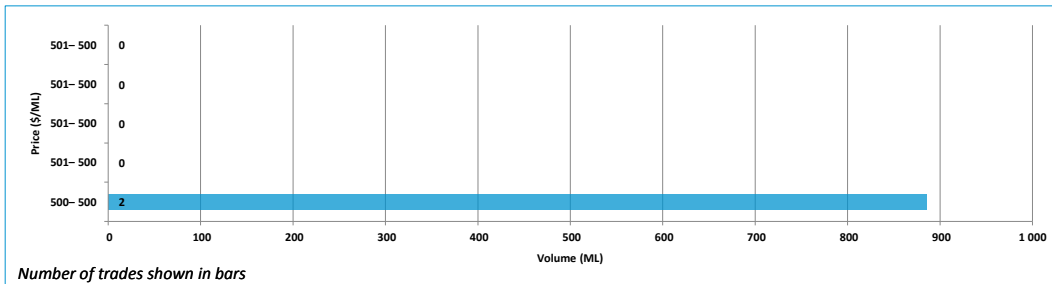
Entitlement market prices and volumes, Lachlan, general security, September 2009 to October 2016



Entitlement market prices and volumes, Lachlan, general security

Volume weighted average price (\$/ML)		October 2016 (in \$/ML)					October 2016	October 2016 #	Broker buy/sell	
Month of	October 2016	YTD	25th percentile	75th percentile	Median	Mean	Mode	Volume	of trades	range (\$/ML)
October 2016	Quarter									
500	497	472	500	500	500	500	500	886	2	400 - 600

Entitlement market price range, Lachlan, general security, by volume October month 2016



Number of trades shown in bars

Water entitlement market prices Murray-Darling Basin (October 2016)

Queensland: Trade Summary

Entitlement market prices and volumes, Lachlan, general security

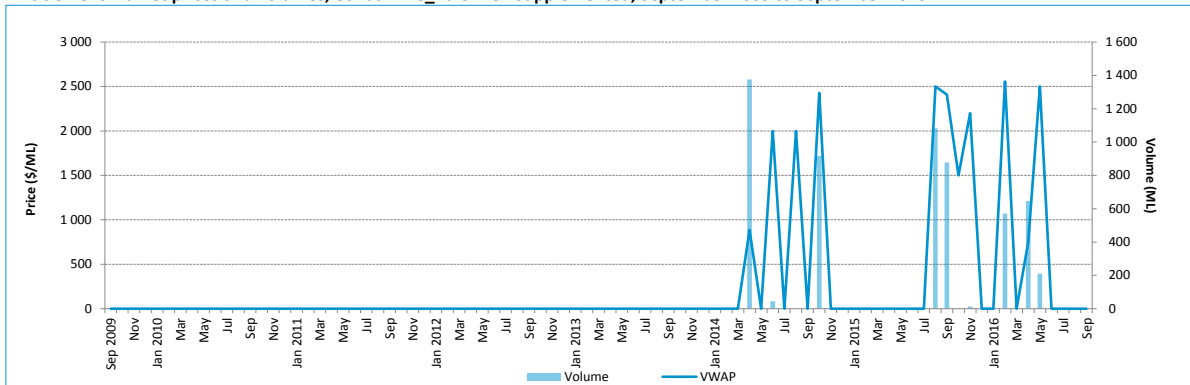
Resource Operation Plan	Water Supply Scheme / Water Management Area	Type of Entitlement	Volume weighted average price (\$/ML)			October 2016 (in \$/ML)					October 2016 # of trades	Broker buy/sell range (\$/ML)	
			Month of October 2016	October 2016 Quarter	YTD	25th percentile	75th percentile	Median	Mean	Mode			
QLD Border Rivers	Border Rivers/ Macintyre Brook	Supplemented	-	1 600	501	-	-	-	-	-	-	-	No listings
QLD Border Rivers	Border Rivers	Unsupplemented	-	-	1 686	-	-	-	-	-	-	-	No listings
Condamine-Balonne	St. George / Upper Condamine	Supplemented	-	-	1 734	-	-	-	-	-	-	-	No listings
Condamine-Balonne	Condamine Balonne / Lower Balonne / Upper Condamine	Unsupplemented	-	1 725	1 382	-	-	-	-	-	-	-	No listings
Condamine-Balonne	Upper Condamine	Alluvium Ground-water	-	-	-	-	-	-	-	-	-	-	No listings
Condamine-Balonne	Lower Balonne	Overland Flow	-	-	-	-	-	-	-	-	-	-	No listings

Water entitlement market prices Murray-Darling Basin (October 2016)

MARSDEN JACOB ASSOCIATES

Condamine Balonne: Supplemented

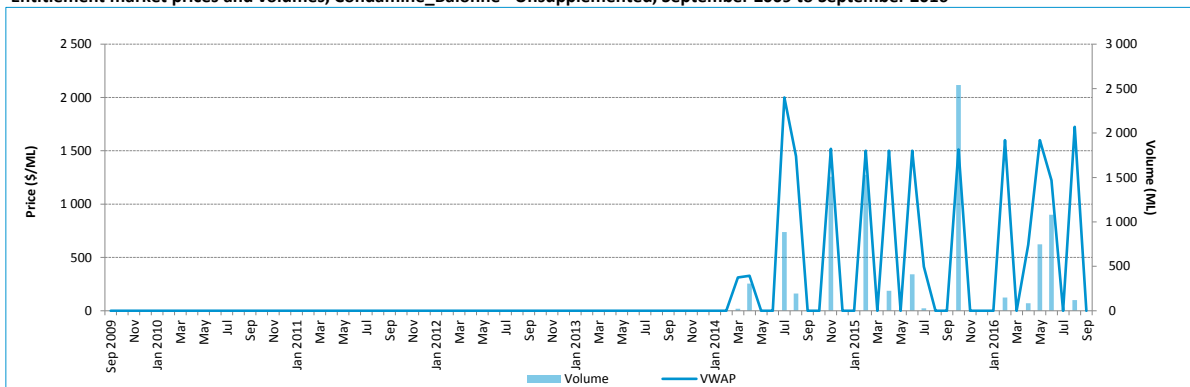
Entitlement market prices and volumes, Condamine_Balonne - Supplemented, September 2009 to September 2016



Note: No October trades have been reported for Queensland. Charts show the monthly trade volume and value until the end of September.

Condamine Balonne: Unsupplemented

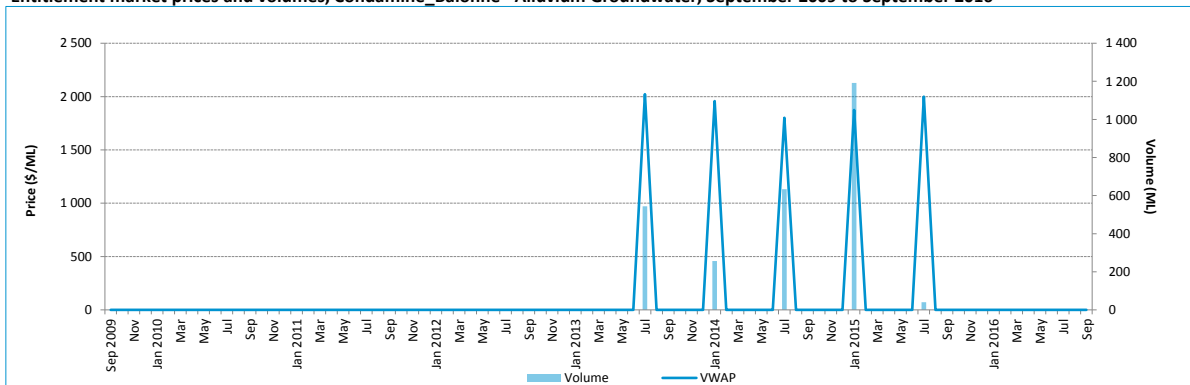
Entitlement market prices and volumes, Condamine_Balonne - Unsupplemented, September 2009 to September 2016



Note: No October trades have been reported for Queensland. Charts show the monthly trade volume and value until the end of September.

Condamine Balonne: Alluvium Groundwater

Entitlement market prices and volumes, Condamine_Balonne - Alluvium Groundwater, September 2009 to September 2016

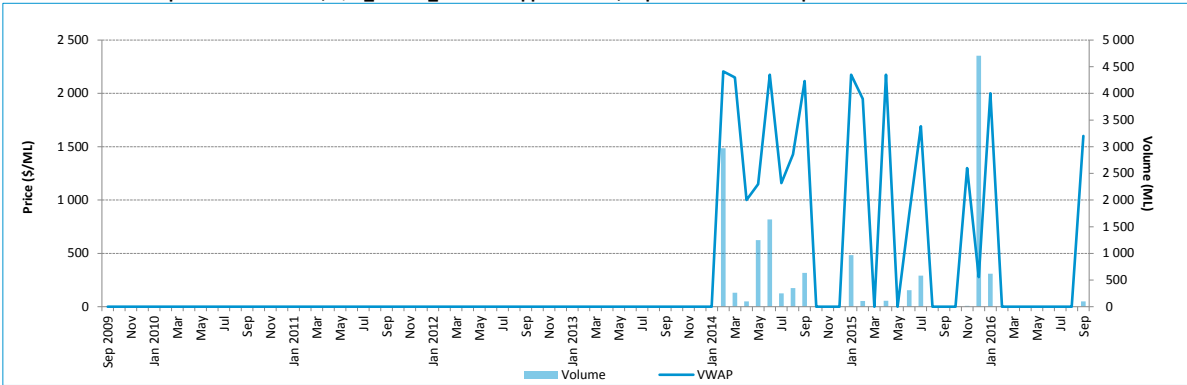


Note: No October trades have been reported for Queensland. Charts show the monthly trade volume and value until the end of September.

Water entitlement market prices Murray–Darling Basin (October 2016)

QLD Border Rivers: Supplemented

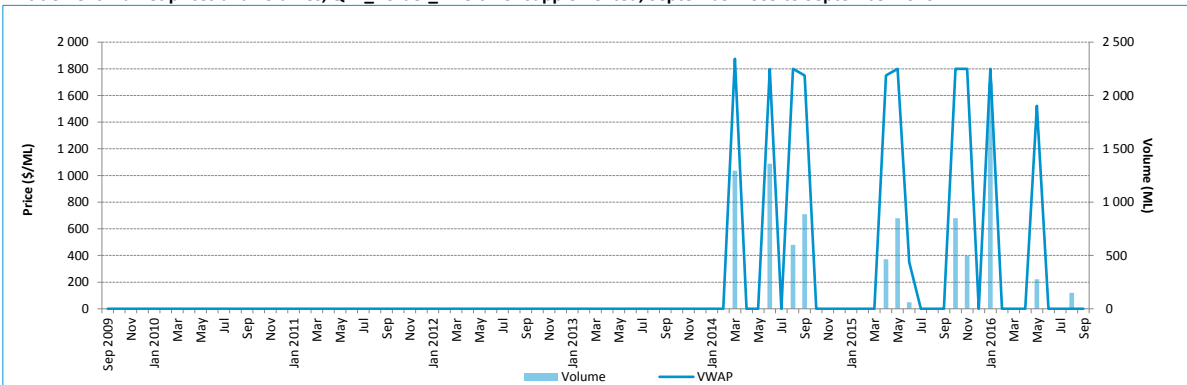
Entitlement market prices and volumes, QLD_Border_Rivers - Supplemented, September 2009 to September 2016



Note: No October trades have been reported for Queensland. Charts show the monthly trade volume and value until the end of September.

QLD Border Rivers: Unsupplemented

Entitlement market prices and volumes, QLD_Border_Rivers - Unsupplemented, September 2009 to September 2016



Note: No October trades have been reported for Queensland. Charts show the monthly trade volume and value until the end of September.

Water entitlement market prices Murray–Darling Basin (October 2016)

Appendix A: Regions and water sources

Table A1 Water sources (southern MDB)

Region	Water source
SA Murray	River Murray Prescribed Water Course (Class 3a)
Vic. Murray above Barmah Choke	6 Vic. Murray Dart to Barmah
Vic. Murray below Barmah Choke	7 Vic. Murray Barmah to SA 6B Lower Broken Creek
Goulburn	1A Greater Goulburn 1B Boort 3 Lower Goulburn
Campaspe	4A Campaspe Eppalock to WWC 4C Lower Campaspe
Loddon	5A Loddon–Coliban Channel to Lower Weir Pool (now SA Loddon – CC/Tull to LWP) 5B Bullarook
NSW Murray	New South Wales Murray Regulated River Water Source
Murrumbidgee	Murrumbidgee Regulated River Water Source
Lower Darling	Lower Darling Regulated River Water Source

Table A2 Water sources (northern MDB)

Region	Water source
Macquarie	Macquarie and Cudgegong Regulated Rivers Water Source
Namoi	Lower Namoi Regulated River Water Source Upper Namoi Regulated River Water Source
Gwydir	Gwydir Regulated River Water Source
NSW Border Rivers	Border Rivers Regulated River Water Source
Barwon–Darling	Barwon–Darling Unregulated River Water Source
Lachlan	Lachlan Regulated River Water Source

Appendix B: Outliers removed

Table B1 shows outliers removed from the trade data in October 2016.

Table B1 Outliers removed from trade data

Date	Catchment	Product name	Volume (ML)	Price (\$)	Price per ML (\$/ML)
10/10/2016	Goulburn	High Reliability	1.00	\$1,400	\$1,400.00
10/10/2016	Goulburn	High Reliability	5.00	\$26,000	\$5,200.00
14/10/2016	Goulburn	High Reliability	2.00	\$3,600	\$1,800.00
19/10/2016	Goulburn	High Reliability	49.70	\$69,580	\$1,400.00
25/10/2016	Goulburn	High Reliability	8.00	\$6,000	\$750.00
11/10/2016	Goulburn	Low Reliability	9.60	\$0	\$100.00
12/10/2016	Goulburn	Low Reliability	500.00	\$112,500	\$150.00
18/10/2016	Goulburn	Low Reliability	114.00	\$0	\$300.00
18/10/2016	Goulburn	Low Reliability	30.70	\$0	\$180.00
19/10/2016	Goulburn	Low Reliability	50.80	\$11,430	\$100.00
21/10/2016	Goulburn	Low Reliability	5.00	\$1,500	\$848.68
26/10/2016	Macquarie	General Security	82.00	\$94,300	\$1,150.00
13/10/2016	Murrumbidgee	High Security	0.00	\$0	\$1.00
26/10/2016	NSW_Border_Rivers	General Security	632.00	\$370,801	\$586.71
26/10/2016	NSW_Border_Rivers	General Security	9661.00	\$3,158,374	\$326.92
13/10/2016	NSW_Murray	General Security	0.00	\$0	\$1.00
17/10/2016	NSW_Murray	General Security	0.00	\$0	\$1.00
24/10/2016	NSW_Murray	General Security	10.00	\$1	\$0.10
17/10/2016	NSW_Murray	High Security	0.00	\$0	\$1.00
17/10/2016	NSW_Murray	High Security	148.00	\$1	\$0.01
6/10/2016	NSW_Murray_Irrigation	General Security	663.00	\$7,624,500.00	\$11,500.00
4/10/2016	Ovens	High Reliability	7.50	\$3,750.00	\$500.00
4/10/2016	Vic_Murray_AboveBC	Low Reliability	69.10	\$19,348.00	\$280.00 *
3/10/2016	Vic_Murray_BelowBC	High Reliability	2.30	\$0.99	\$0.43
3/10/2016	Vic_Murray_BelowBC	High Reliability	2.00	\$2,000.00	\$1,000.00
19/10/2016	Vic_Murray_BelowBC	High Reliability	2.00	\$400.00	\$200.00
12/10/2016	Vic_Murray_BelowBC	Low Reliability	9.70	\$19,400.00	\$2,000.00

* - Trades are within the bounds of two standard deviations for the catchment, but have been excluded