

FOUR ARROWS ETHANOL PTY LTD : Vehicle movements generated by development



VEHICLES TRANSPORTING RESOURCES AND STAFF ONTO SITE PER YEAR

Ethanol Inputs/ year

| Product | Tonnes/year | Vehicle type | Tonnes/load | Numbers |
|----------------|----------------|--------------|-------------|---------------|
| Wheat | 303,750 t | heavy | 38 t | 7,993 |
| Barley | 236,250 t | heavy | 38 t | 6,217 |
| Corn | 135,000 t | heavy | 38 t | 3,553 |
| Citrus pulp | 0 t | heavy | 38 t | 0 |
| Winegrape marc | 0 t | heavy | 38 t | 0 |
| Rice hulls | 0 t | heavy | 38 t | 0 |
| Sugar beet | 0 t | heavy | 38 t | 0 |
| Additives | 3,794 t | heavy | 38 t | 100 |
| Total | 678,794 | | | 17,863 |

Dairy Inputs/ year

| Product | Tonnes/year | Vehicle type | Tonnes/load | Numbers |
|--------------|-------------|--------------|-------------|--------------|
| Grain | 16,759 t | heavy | 38 t | 441 |
| Silage | 89,956 t | heavy | 38 t | 2367 |
| Cotton seed | 6,841 t | heavy | 38 t | 180 |
| Molasses | 1,747 t | heavy | 38 t | 46 |
| Sundries | 2,263 t | heavy | 38 t | 60 |
| Total | | | | 3,094 |

Others

| Product | Tonnes/year | Vehicle type | Tonnes/load | Numbers |
|-------------------|-------------|--------------|-------------|----------|
| Replacement stock | 0 heifers | heavy | 90 head | 0 |
| Totals | | | | 0 |

Ethanol and Dairy Staff

| | Numbers |
|--|---------------|
| 100 staff @ 1.0 person/ light vehicle 365 days | 36,500 |
| Total | 36,500 |

VEHICLES TRANSPORTING PRODUCT, WASTE & STAFF OFFSITE PER YEAR

Ethanol outputs/ year

| Product | Measurement | Vehicle type | Measurement | Numbers |
|----------------------|-------------|--------------|---------------|---------------|
| Wet distillers grain | 1,434,619 t | heavy | 40 t | 35,865 |
| Ethanol production | 299 ML | heavy | 30,000 litres | 9,966 |
| CO2 production | 235,892 t | heavy | 39 t | 6,127 |
| Total | | | | 51,959 |

Dairy outputs/ year

| Product | Measurement | Vehicle type | Measurement | Numbers |
|---------------|-------------------|--------------|---------------|--------------|
| Manure | 29,952 t | heavy | 40 t | 749 |
| Culled cattle | 3,009 head | heavy | 90 head | 33 |
| Milk | 76,650,000 litres | heavy | 30,000 litres | 2,555 |
| Total | | | | 3,337 |

| | | |
|----------|--|---------------|
| D | Trucks required to pick-up product & waste | 55,296 |
| E | Less 50% backloads | 10,478 |
| F | Total | 44,817 |

Ethanol and Dairy Staff

| | Numbers |
|---|---------------|
| 100 staff @ 1.0 people / light vehicle 365 days | 36,500 |
| Total | 36,500 |

SPREADSHEET RESULTS (worst case scenario)

| | | | |
|--|---------|-----------------------------------|-----------------------------------|
| Total vehicle movement per year | 225,505 | 60% vehicles north per/day | 40% vehicles south per/day |
| Total heavy vehicle movement per year | 152,505 | | |
| Total light vehicle movement per year | 73,000 | | |
| Average annual daily heavy vehicle movement | 418 | 251 | 167 |
| Average annual daily light vehicle movement | 200 | 120 | 80 |
| Total daily vehicle movements | 618 | 371 | 247 |
| Average heavy vehicle movements per hour over 15 hour period | 28 | 17 | 11 |

SPREADSHEET ASSUMPTIONS

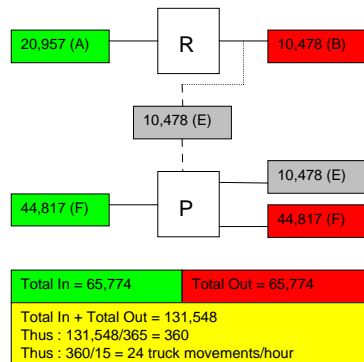
Heavy vehicle movements will be over a fifteen (15) hour period between 7am and 10pm
 6000 milkers will be in production 365 days of the year producing 35 litres/day/cow
 Only a percentage of trucks will be back-loading output from the site
 The largest capacity trucks possible will be utilised for all transporting
 100 people will be employed 365 days of the year in both ethanol production and dairy enterprise
 There is no public transport option available to the site
 50% of trucks that deliver grain and resources can be back-loaded with wet brewers grain etc
 60% of all vehicles will be to and from a northerly direction whilst 40% of vehicles will be to and from a southerly direction

SCENARIO AT 50% BACKLOAD WITH CARPOOLING (improved vehicle efficiency)

| | | | | |
|---|----------------|----------------|------------------------------------|------------------------------------|
| Heavy vehicles moving onsite loaded with resources | 20,957 | A | | |
| Heavy vehicles moving offsite empty after unloading i.e. 50% will remain for backload | 10,478 | B | | |
| Total | 31,435 | (A+B)=C | | |
| Heavy vehicles required to move onsite to pickup product & waste | 55,296 | D | | |
| Heavy vehicles remaining onsite from resource delivery back-loaded with product | 10,478 | (A-B)=E | | |
| Total | 44,817 | (D-E)=F | | |
| Heavy vehicles moving onto site empty to pick-up product & waste | 44,817 | F | | |
| Heavy vehicles moving offsite loaded with product and waste | 55,296 | D | | |
| Total | 100,113 | (F+D)=G | | |
| Total heavy vehicle movements per year | 131,548 | (G+C)=H | 60% vehicles north per/day | 40% vehicles south per/day |
| Average annual daily heavy vehicle movements | 360 | (H/365 days)=I | 216 | 144 |
| Average annual staff vehicle movements i.e., carpooling 2 passengers/vehicle | 100 | J | 60 | 40 |
| Total daily vehicle movements | 460 | I+J | 276 | 184 |
| <i>If the heavy vehicle movements are conducted over the 15 hour period between 7am and 10pm which allows the maximum daily noise goal being 55dB</i> | | | 60% vehicles north per/hour | 40% vehicles south per/hour |
| Truck movements per hour | 24 | I/15 | 14 | 10 |

GRAPHICAL REPRESENTATION OF TRUCK MOVEMENTS (50% BACKLOAD)

- = Trucks On Site
- = Trucks Off Site
- = Trucks Backloaded
- R = Resource Delivery Onsite
- P = Product/Waste Offsite
- = Summary



FOUR ARROWS ETHANOL PTY LTD : Daily % increase of total vehicles due to development utilising AADT figures



| Station Number | Roadway | Position | Recording year | Counts axle pairs | Counts vehicles | AADT |
|----------------|------------|---|----------------|-------------------|-----------------|------|
| 95.317 | Kidman Way | Willbriggie-at rail crossing | 2003 | no | yes | 1927 |
| 97.162 | Kidman Way | Darlington Pt - at Murrumbidgee River | 2003 | no | yes | 2517 |
| 97.119 | Kidman Way | Darlington Pt - 0.4km South SH14, Sturt Hwy | 2003 | yes | no | 1516 |
| 97.246 | Kidman Way | Coleambally - South MR 596, Morundah Rd | 2003 | no | yes | 1075 |
| 97.035 | Newell Hwy | Jerilderie - North MR 59, Urana Road | 2003 | no | yes | 3114 |
| 97.112 | Sturt Hwy | Carrathool - East Conargo Road | 2003 | no | yes | 1418 |
| 95.021 | Sturt Hwy | At Murrumbidgee Shire boundary | 2003 | no | yes | 1651 |

AADT source : RTA Traffic volume data 2003

ASSUMPTIONS

Traffic counts comprise of total vehicles heading in either direction along the thoroughfare.

Northerly and southerly split values of 60%/40% give a more accurate indication of actual vehicles that will be travelling past stations.

Northerly and southerly split values have been calculated by assuming all inputs to the enterprise are arriving primarily from a northerly direction and product and derivative movement is approx. equal north and south.

Values for station 97.119 are not included in the comparison text as it is the only station counting axle pairs and not vehicles as do the other stations.

% INCREASE IN VEHICLES

| | Traffic movements north 60% total volume | Traffic movements south 40% total volume | Increased vehicle numbers/day |
|--|---|---|----------------------------------|
| <i>Using non-scenario results from spreadsheet "vehicle movements"</i> | | | |
| Willbriggie-at rail crossing | 19% | N/A | 371 |
| Darlington Pt - at Murrumbidgee River | 15% | N/A | 371 |
| Darlington Pt - 0.4km South SH14, Sturt Hwy | 24% | N/A | 371 |
| Coleambally - South MR 596, Morundah Rd | N/A | 23% | 247 |
| Jerilderie - North MR 59, Urana Road | N/A | 8% | 247 |
| Carrathool - East Conargo Road | 26% | N/A | 371 |
| At Murrumbidgee Shire boundary | 22% | N/A | 371 |
| <i>Using scenario results from spreadsheet "vehicle movements" incorporating Improved vehicle efficiencies</i> | | | |
| Willbriggie-at rail crossing | 14% | N/A | 276 |
| Darlington Pt - at Murrumbidgee River | 11% | N/A | 276 |
| Darlington Pt - 0.4km South SH14, Sturt Hwy | 18% | N/A | 276 |
| Coleambally - South MR 596, Morundah Rd | N/A | 17% | 184 |
| Jerilderie - North MR 59, Urana Road | N/A | 6% | 184 |
| Carrathool - East Conargo Road | 19% | N/A | 276 |
| At Murrumbidgee Shire boundary | 17% | N/A | 276 |

N/A : Not Applicable

FOUR ARROWS ETHANOL PTY LTD : Daily % increase of vehicle classes due to development by extrapolating vehicle counts



| Location | Vehicle class | Description | Sensing period | Number days | Total Vehicles | Vehicles/day |
|--|---------------|---------------------------|-------------------------|-------------|----------------|--------------|
| Between Hogan Lane & Cattanach Road | Class 1 | Light short vehicle | 27/06/2005-11/07/2005 | 14 | 9,240 | 660 |
| | Class 2 | Light short towing | 27/06/2005-11/07/2005 | 14 | 675 | 48 |
| | Class 3 | Heavy 2 axle truck or bus | 27/06/2005-11/07/2005 | 14 | 635 | 45 |
| | Class 4 | Heavy 3 axle truck or bus | 27/06/2005-11/07/2005 | 14 | 165 | 12 |
| | Class 5 | Heavy 4 axle truck | 27/06/2005-11/07/2005 | 14 | 18 | 1 |
| | Class 6 | Heavy 3 axle articulated | 27/06/2005-11/07/2005 | 14 | 34 | 2 |
| | Class 7 | Heavy 4 axle articulated | 27/06/2005-11/07/2005 | 14 | 79 | 6 |
| | Class 8 | Heavy 5 axle articulated | 27/06/2005-11/07/2005 | 14 | 231 | 17 |
| | Class 9 | Heavy 6 axle articulated | 27/06/2005-11/07/2005 | 14 | 601 | 43 |
| | Class 10 | B Double | 27/06/2005-11/07/2005 | 14 | 601 | 43 |
| | Class 11 | Double road train | 27/06/2005-11/07/2005 | 14 | 126 | 9 |
| | Class 12 | Triple road train | 27/06/2005-11/07/2005 | 14 | 3 | 0 |
| | Class 13 | N/A | 27/06/2005-11/07/2005 | 14 | 202 | 14 |
| Kidman Way, north of Gumview café | Class 1 | Light short vehicle | 27/04/2004-11/05/2004 | 14 | 18,993 | 1,357 |
| | Class 2 | Light short towing | 27/04/2004-11/05/2004 | 14 | 957 | 68 |
| | Class 3 | Heavy 2 axle truck or bus | 27/04/2004-11/05/2004 | 14 | 833 | 60 |
| | Class 4 | Heavy 3 axle truck or bus | 27/04/2004-11/05/2004 | 14 | 1,297 | 93 |
| | Class 5 | Heavy 4 axle truck | 27/04/2004-11/05/2004 | 14 | 144 | 10 |
| | Class 6 | Heavy 3 axle articulated | 27/04/2004-11/05/2004 | 14 | 34 | 2 |
| | Class 7 | Heavy 4 axle articulated | 27/04/2004-11/05/2004 | 14 | 113 | 8 |
| | Class 8 | Heavy 5 axle articulated | 27/04/2004-11/05/2004 | 14 | 132 | 9 |
| | Class 9 | Heavy 6 axle articulated | 27/04/2004-11/05/2004 | 14 | 1,856 | 133 |
| | Class 10 | B Double | 27/04/2004-11/05/2004 | 14 | 1,448 | 103 |
| | Class 11 | Double road train | 27/04/2004-11/05/2004 | 14 | 174 | 12 |
| | Class 12 | Triple road train | 27/04/2004-11/05/2004 | 14 | 10 | 1 |
| | Class 13 | N/A | 27/04/2004-11/05/2004 | 14 | 1,265 | 90 |
| Kidman way, North side of Darlington Point | Class 1 | Light short vehicle | 01/02/05 - 14/02/2005 | 13 | 16,897 | 1,300 |
| | Class 2 | Light short towing | 01/02/05 - 14/02/2005 | 13 | 667 | 51 |
| | Class 3 | Heavy 2 axle truck or bus | 01/02/05 - 14/02/2005 | 13 | 718 | 55 |
| | Class 4 | Heavy 3 axle truck or bus | 01/02/05 - 14/02/2005 | 13 | 239 | 18 |
| | Class 5 | Heavy 4 axle truck | 01/02/05 - 14/02/2005 | 13 | 26 | 2 |
| | Class 6 | Heavy 3 axle articulated | 01/02/05 - 14/02/2005 | 13 | 34 | 3 |
| | Class 7 | Heavy 4 axle articulated | 01/02/05 - 14/02/2005 | 13 | 105 | 8 |
| | Class 8 | Heavy 5 axle articulated | 01/02/05 - 14/02/2005 | 13 | 367 | 28 |
| | Class 9 | Heavy 6 axle articulated | 01/02/05 - 14/02/2005 | 13 | 1,070 | 82 |
| | Class 10 | B Double | 01/02/05 - 14/02/2005 | 13 | 1,395 | 107 |
| | Class 11 | Double road train | 01/02/05 - 14/02/2005 | 13 | 344 | 26 |
| | Class 12 | Triple road train | 01/02/05 - 14/02/2005 | 13 | 8 | 1 |
| | Class 13 | N/A | 01/02/05 - 14/02/2005 | 13 | 106 | 8 |
| North side, heading into Griffith | Class 1 | Light short vehicle | 06/09/2005 - 20/09/2005 | 14 | 138 | 10 |
| | Class 2 | Light short towing | 06/09/2005 - 20/09/2005 | 14 | 18,571 | 1,327 |
| | Class 3 | Heavy 2 axle truck or bus | 06/09/2005 - 20/09/2005 | 14 | 750 | 54 |
| | Class 4 | Heavy 3 axle truck or bus | 06/09/2005 - 20/09/2005 | 14 | 107 | 8 |
| | Class 5 | Heavy 4 axle truck | 06/09/2005 - 20/09/2005 | 14 | 334 | 24 |
| | Class 6 | Heavy 3 axle articulated | 06/09/2005 - 20/09/2005 | 14 | 334 | 24 |
| | Class 7 | Heavy 4 axle articulated | 06/09/2005 - 20/09/2005 | 14 | 13 | 1 |
| | Class 8 | Heavy 5 axle articulated | 06/09/2005 - 20/09/2005 | 14 | 225 | 16 |
| | Class 9 | Heavy 6 axle articulated | 06/09/2005 - 20/09/2005 | 14 | 279 | 20 |
| | Class 10 | B Double | 06/09/2005 - 20/09/2005 | 14 | 2,141 | 153 |
| | Class 11 | Double road train | 06/09/2005 - 20/09/2005 | 14 | 75 | 5 |
| | Class 12 | Triple road train | 06/09/2005 - 20/09/2005 | 14 | 2 | 0 |
| | Class 13 | N/A | 06/09/2005 - 20/09/2005 | 14 | 72 | 5 |

ASSUMPTIONS

Traffic counts comprise of total vehicles heading in either direction along the thoroughfare.

Traffic considered entering and exiting the site for the purpose of this Traffic Impact Study will include .
B-doubles and light short vehicles only.

Southerly and northerly split values give a more accurate indication of actual vehicles traveling past stations.

Southerly and northerly split values have been calculated by assuming all inputs to the enterprise are arriving from a northerly direction and product and derivative movement approx. equal north and south.

Values for vehicles heading into Griffith will not be commented upon as heavy vehicle and light vehicle movement would have depleted considerably by this point.

% INCREASE OF HEAVY AND LIGHT VEHICLE CLASSES

| | Traffic north of egress 60% total volume | Traffic south of egress 40% total volume |
|--|---|---|
| <i>Using non-scenario results from spreadsheet "vehicle movements"</i> | | |
| % increase for heavy vehicles between Hog.Ln & Catt.Rd per day | N/A | 87% |
| % increase for light vehicles between Hog.Ln & Catt.Rd per day | N/A | 11% |
| % increase for heavy vehicles north of Gumview café | 48% | N/A |
| % increase for light vehicles north of Gum view café | 8% | N/A |
| % increase heavy vehicles north side, Darlington Point | 74% | N/A |
| % increase light vehicles north side, Darlington Point | 9% | N/A |
| % increase heavy vehicles, heading into Griffith | 81% | N/A |
| % increase light vehicles, heading into Griffith | 9% | N/A |

Using scenario results from spreadsheet "vehicle movements" incorporating Improved vehicle efficiencies

| | | |
|--|-----|-----|
| % increase for heavy vehicles between Hog.Ln & Catt.Rd per day | N/A | 75% |
| % increase for light vehicles between Hog.Ln & Catt.Rd per day | N/A | 6% |
| % increase for heavy vehicles north of Gumview café per day | 41% | N/A |
| % increase for light vehicles north of Gumview café per day | 4% | N/A |
| % increase heavy vehicles north side, Darlington Point per day | 64% | N/A |
| % increase light vehicles north side, Darlington Point per day | 4% | N/A |
| % increase heavy vehicles, heading into Griffith per day | 70% | N/A |
| % increase light vehicles, heading into Griffith per day | 4% | N/A |