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# Nebraska Department of Natural Resources Preliminary Republican River Basin Forecast for 2018

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## Topic Outline

- Forecast 2016-2017 Projection with Management Actions
  - Preliminary 2016 and 2017 Accounting Results
  - Early Dry-year Forecast (2018)
  - Compact Call Year Evaluation Flow Chart
  - Forecasted NRD Projections for 2018
  - Kansas Compliance Water Request Update
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# Preliminary Accounting Results (2016-2017)

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## Forecast 2016-2017 Projection (issued Dec. 2016) with Management Actions

	LRNRD	MRNRD	URNRD	Total
2016 Balance (Provisional)	5,700	-400	-900	4,400
2017 Balance (Forecast)	-12,800	-10,800	-17,800	-41,400
2-Year Balance (from Forecast)	-7,100	-11,200	-18,700	-37,000
2017 Management Actions	3,800	7,300	10,100	21,200
2017 Balance with NRD Management Actions	-9,000	-3,500	-7,700	-20,200
<b>2-Year Balance (with management actions)</b>	<b>-3,300</b>	<b>-3,900</b>	<b>-8,600</b>	<b>-15,800</b>

- \*Units are acre-feet unless otherwise noted.
- \*\*All values rounded to nearest 100. Sum of subtotals may not equal totals due to rounding.

## 2015-2016 RCCV Distribution (from Forecast issued Dec. 2016)

	<b>LRNRD</b>	<b>MRNRD</b>	<b>URNRD</b>	<b>Total</b>
2015 Balance	-9,900	-4,200	300	-13,700
2016 Balance (Provisional)	5,800	-400	-900	4,400
<b>Remaining Compact Compliance Volume Accumulated in 2016</b>	<b>-4,100</b>	<b>-4,600</b>	<b>-600</b>	<b>-9,300</b>

## Final 2016 Accounting

<b>Total Actual Compact Balance without NRD actions or RCCV Credit</b>				<b>-27,300</b>
	LRNRD	MRNRD	URNRD	Total
Actual GW Depletion	49,000	56,300	83,500	188,800
Distribution Percentage	25.9%	29.8%	44.2%	100.0%
Balance by NRD (no action)	-7,100	-8,100	-12,100	-27,300
Total Management Actions	12,100	8,300	12,300	32,600
Remaining Compact Compliance Volume	4,100	4,600	600	9,300
<b>2016 Balance</b>	<b>9,100</b>	<b>4,800</b>	<b>800</b>	<b>14,700</b>

# Preliminary 2017 Accounting

Year	Item	Information Source
<b>Provisional Data for T=0 (Current Year or Immediate Past Irrigation Season)</b>	Pumping	2016 Pumping
	Surface Water Use	Estimated from preliminary data and previous years values
	Streamflow	Available provisional records – end-of-year estimated
	Evaporation	2016 records and provisional data

# Preliminary 2017 Accounting – Guide Rock

<b>Total Accounting Balance without NRD actions</b>				<b>2,500</b>
	LRNRD	MRNRD	URNRD	Total
Actual GW Depletion	49,700	55,900	79,700	185,200
Distribution Percentage	26.8%	30.2%	43.0%	100.0%
Balance by NRD (no action)	700	700	1,100	2,500
Total Management Actions	3,800	7,300	10,100	21,200
<b>2017 Balance</b>	<b>4,500</b>	<b>8,000</b>	<b>11,100</b>	<b>23,600</b>



## Current Projection: 2016-2017 Balance at Guide Rock with Management Actions

	LRNRD	MRNRD	URNRD	Total
2016 Balance (final)	7,400	2,900	4,300	14,700
2017 Balance (projected)	4,500	8,000	11,100	23,600
<b>2016-2017 Balance (projected)</b>	<b>11,900</b>	<b>10,900</b>	<b>15,500</b>	<b>38,300</b>
Remaining Compact Compliance Volume (RCCV)	-4,100	-4,600	-600	-9,300

## Current Projection: 2013-2017 Balance at Hardy with Management Actions

	Total
2013-2016 Balance (final)	90,000
2017 Balance (projected)	31,300
<b>2013-2017 Balance (projected)</b>	<b>121,300</b>
Remaining Compact Compliance Volume (RCCV)	-9,300

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# Early Dry-Year Forecast (2018)

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# Dry-Year Forecast

Year	Item	Information Source
<b>Forecast Year T+1 (Coming Irrigation Season)</b>	Groundwater Consumptive Use and Imported Water Supply Credit	Average Values for T=0 and T-1
	Surface Water Consumptive Use	Colorado: Average of T-1 and T-2 use Kansas: $+(0.1858 \times \text{HCLcontent}) + 9,575$ Nebraska: $-(4 \times 10^{-7}) \times (\text{NE lake volume})^2 + 0.52 \times \text{NElakeVolume} - 42,000$
	Streamflow	$(5\text{-year average of state line flows}) \times 0.41 + 0.23 \times \text{HCLcontent} - 27,450$

# Compliance Balances

<b>Year</b>	<b>Guide Rock Balance (AF)</b>
T=0 (2017, projected)	23,600
T=+1 (2018, early forecast)	-37,800
2-Year Forecast Balance	-14,200

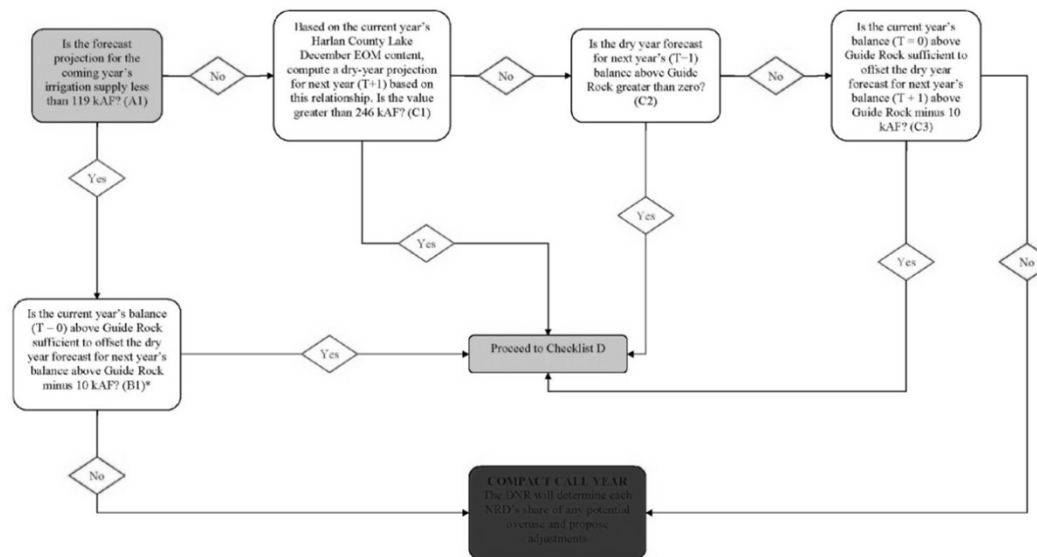
<b>Year</b>	<b>Hardy Balance (AF)</b>
T=-3 to 0 (2014-2017, projected)	109,500
T=+1 (2018, early forecast)	-32,400
5-Year Forecast Balance	77,100

# Compact Call Year Evaluation: Checklist A.

Is the forecast projection for the coming year's irrigation supply less than 119 kAF?

**YES**  
Proceed to Checklist B.

Republican River Water Supply Evaluation and Required Actions  
*Water Short Year Administration—Checklists A, B, and C*

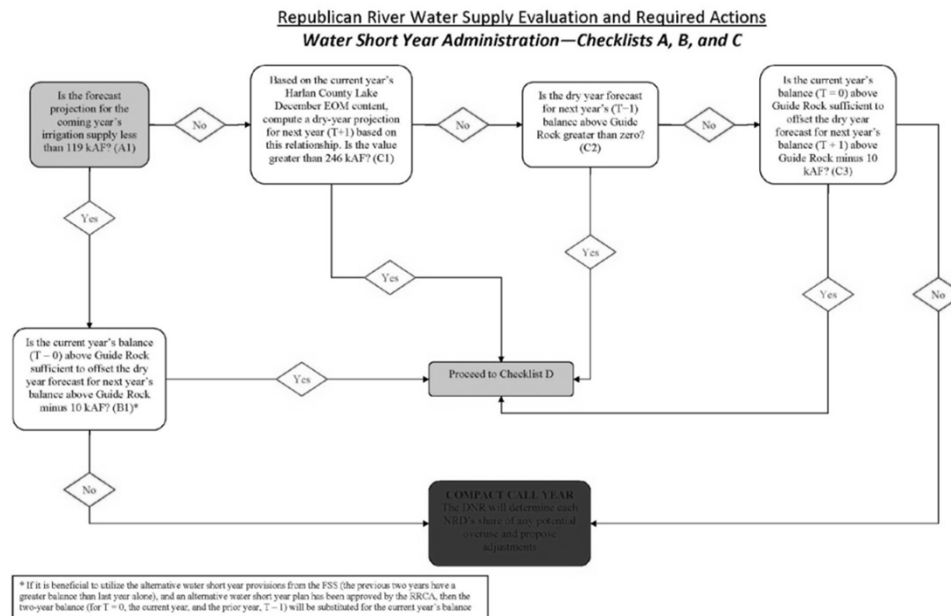


\* If it is beneficial to utilize the alternative water short year provisions from the FSS (the previous two years have a greater balance than last year alone), and an alternative water short year plan has been approved by the SRCA, then the two-year balance (for T = 0, the current year, and the prior year, T - 1) will be substituted for the current year's balance

# Compact Call Year Evaluation: Checklist B.

Is the current year's balance (T=0) above Guide Rock sufficient to offset the dry year forecast for next year's balance above Guide Rock?

**NO – Compact Call Year is Forecast.**



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# NRD-Specific Forecast Balances

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## NRD Annual Guide Rock Balance Forecast for Upcoming Year (2018)

	LRNRD	MRNRD	URNRD	Total
Allowable Depletion Distribution Percentage from IMPs	24.5%	31.1%	44.4%	100.0%
Allowable Groundwater Depletions	36,600	46,400	66,300	149,000
Projected Groundwater Depletions	49,300	56,100	81,600	187,000
2018 Forecast Balance (no action)	-12,800	-9,700	-15,300	-37,800
Current Year (2017) Balance	4,500	8,000	11,100	23,600
<b>Total Forecast by NRD</b>	<b>-8,300</b>	<b>-1,700</b>	<b>-4,200</b>	<b>-14,200</b>

## Projected Obligations for Upcoming Year (2018)

	<b>LRNRD</b>	<b>MRNRD</b>	<b>URNRD</b>	<b>Total</b>
2017-2018 Balance (Forecast)	-8,300	-1,700	-4,200	-14,200
Remaining Compact Compliance Volume	-4,100	-4,600	-600	-9,300
<b>Total Forecast Obligation</b>	<b>-12,400</b>	<b>-6,300</b>	<b>-4,800</b>	<b>-23,500</b>

# Summary

- Based on the preliminary forecast, the IMP checklist indicates that a Compact Call Year will be in place in 2018
- Preliminary approximate 2017 accounting balances:
  - Guide Rock: 23,600 ac-ft
  - Hardy: 31,300 ac-ft
- Preliminary dry-year forecast balance for 2018 currently approximated at -37,800 ac-ft at Guide Rock (-32,400 ac-ft at Hardy)
- Total projected shortfall including Remaining Compact Compliance Volume for 2017-2018 of approximately -23,500 ac-ft
- Kansas did not request any water for delivery by June 1, 2018

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## Next Steps

- The Department will complete its final forecast prior to January 1, 2018
  - Department will issue Compact Call Year order
  - NRDs will identify means to address potential Compact shortfall, but no actions will be required prior to October 1, 2018
  - Department will monitor water-short trigger
  - Department will reassess the necessity for management action late summer/post-irrigation 2018

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