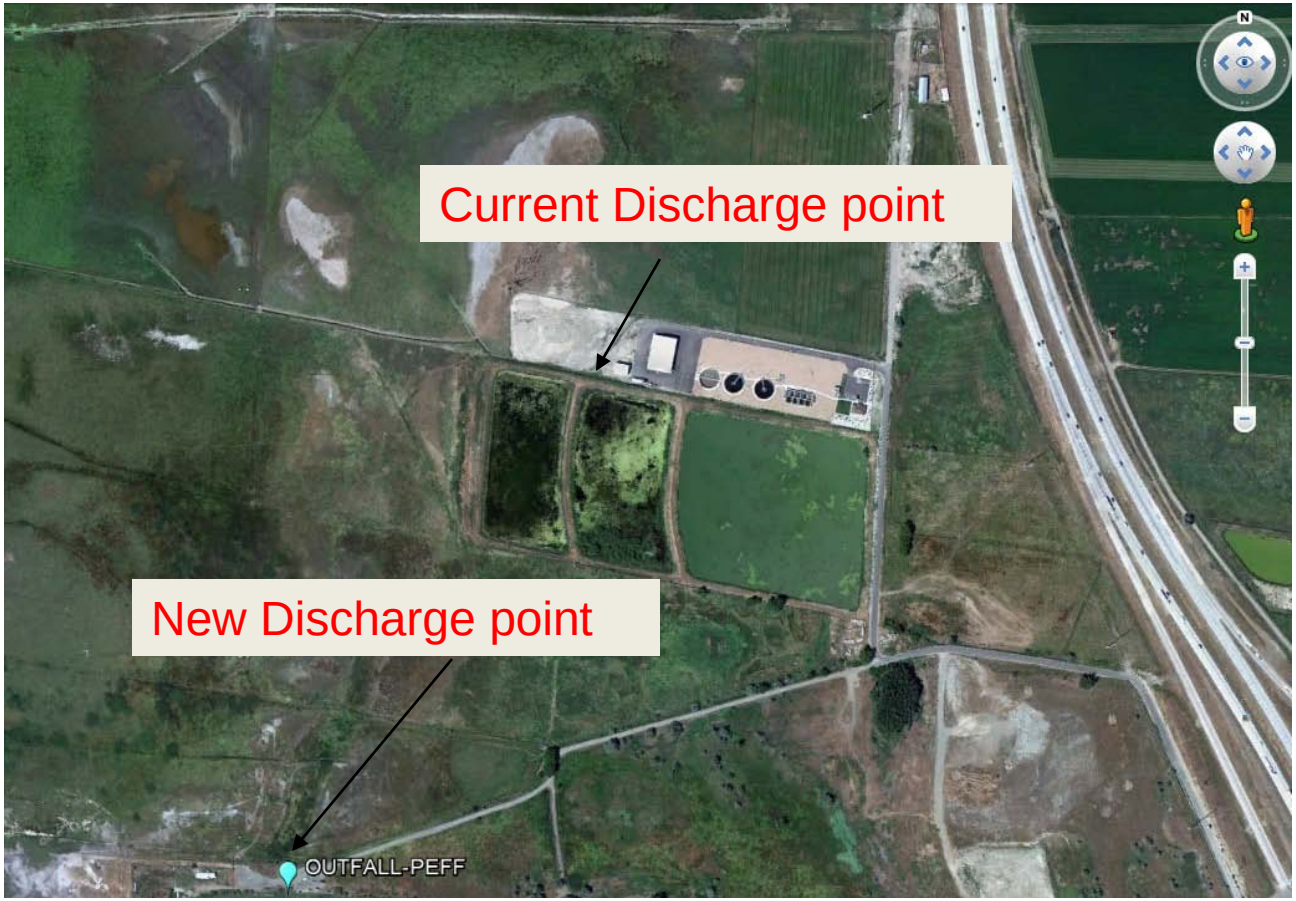
Willard Spur
2012 and 2011

# Background:

In 2010, the construction of Perry/Willard Regional Wastewater Treatment Plant was completed.



# Concerns:

The potential impact the effluent could have on the water body, compromise the protection of the wetlands and current uses of the water.

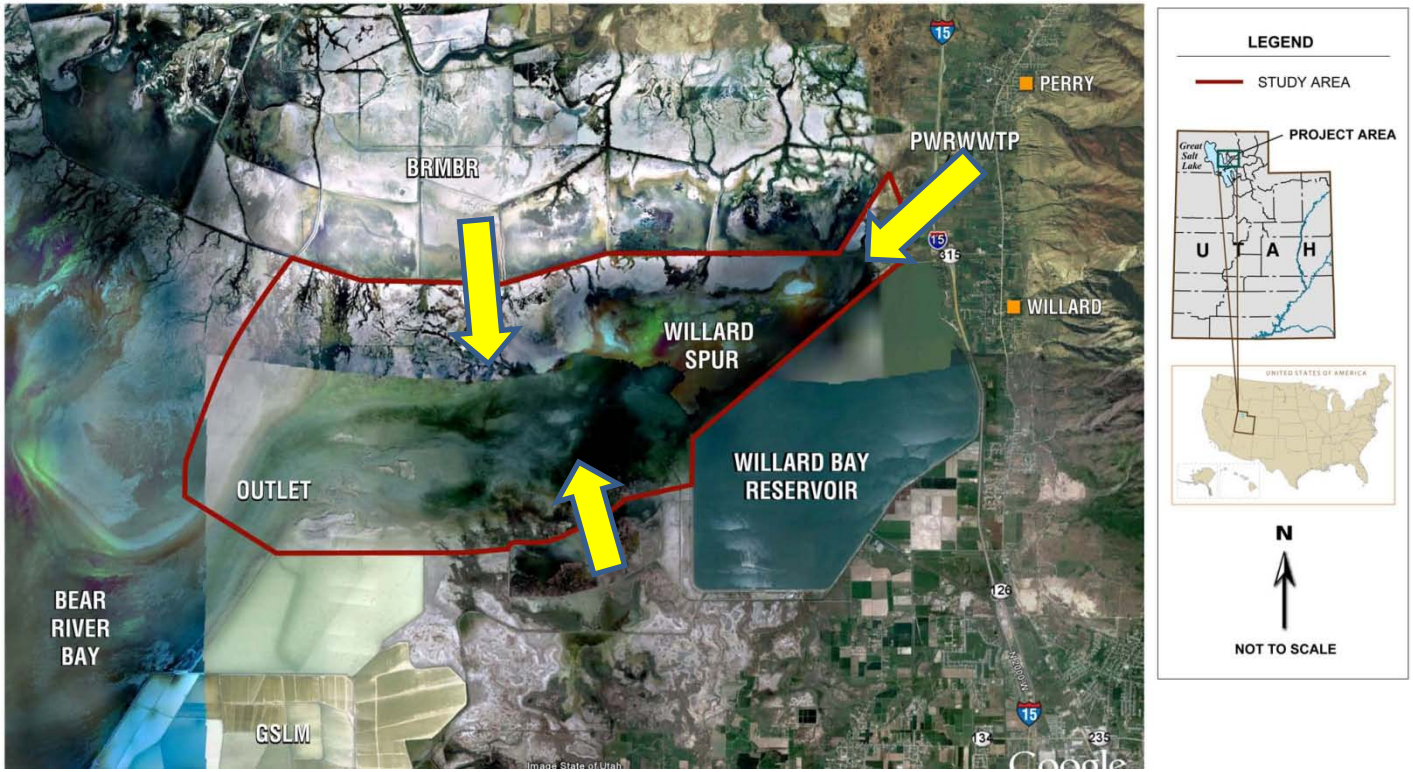
# Objective of the Study:

1.Provide background information describing the overall condition and function of Willard Spur. Data from 2012 will allow for a comparison of the overall condition of Willard Spur between the years 2011 and 2012 and better understand the dynamics of the ecosystem related to hydrology.

2. Infer if the Willard/Perry WWTP's discharge to Willard Spur has any greater impact on the beneficial uses of Willard Spur on a normal to dry water year compared to an above average water year.

3. Augment experiments being completed in 2012 to understand the nutrient cycling process within Willard Spur. These experiments will be examining effects on localized test plots. Data from this SAP will enable the Science Panel to better understand conditions throughout Willard Spur in relation to these test plots (Willard Spur 2012 Sampling Plan-CH2MHILL).

# Site Description




Source: Willard Spur 2012 Sampling Plan-CH2MHILL

# The *Nature* of the project in the field:

Weather conditions

Equipment failure

Broken Airboat

Access issues

Animals

# East Inflows reduced

2011-June

2012-May

Problems launching the airboat

# **WEATHER CONDITIONS :** Dry Year

WS-9 (2012-WS061612)

WS-9 (2011-WS07052011)

# WEATHER CONDITIONS : Dry Year-cont.

# WEATHER CONDITIONS : Dry Year-cont.

Tailrace channel

# WEATHER CONDITIONS : Dry Year-cont.

BRR-3 (2012-WS071612)

BRR-3 (2011-WS07052011)

Flow Measurements: 2011-October and 2012-May

In May 2012 , the Willard Spur had already dried up ~400m from both the south and north end.

## ANIMALS

Downloading Pressure Transducer Data

# Water temperatures:

Beginning of 2011 and 2012 sampling season;
WS-1 in WS06062011 T=15.80$^{o}$C
WS-12 in WS06062011 T=22.57$^{o}$C

WS-1 in WS042312 T=10.62$^{o}$C
WS-12 in WS042312 T=17.03$^{o}$C

End of 2011 sampling season;
WS-1 in WS10112011 T=13.29$^{o}$C
WS-12 in WS10112011 T=11.18$^{o}$C

Last 2012 reading by June 2012$^{o}$C

WS-1 T=28.57
WS-12 dry
WS-9 T=18.81$^{o}$C

# Water Depths in the Spur

Beginning of 2011 and 2012 sampling season;
WS-1 in WS06062011 D=0.95m
WS-12 in WS06062011 D=0.47m

WS-1 in WS042312 D=0.32m
WS-12 in WS042312 D=0.20m

End of 2011 and 2012 sampling season;
WS-1 in WS10112011 D=0.35m
WS-12 in WS10112011 D=0.29m

The water depth at the end of 2011 at WS-12 was almost the water depth we had at WS-1 in 2012.

# Specific Conductance:

| | SP.cond. (µS/cm) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | |
| Date | WS-1 | WS-2 | WS-3 | WS-3Z | WS-4 | WS-5 | WS-6 | WS-7 | WS-8 | WS-9 | WS-10 | WS-10Z | WS-11 | WS-12 | OUT-HC-WMA-DD | OUTFALL-CNFL | IN-WB-TAILRACE | OUT-WB-TAILRACE |
| | | | | | | | | | | | | | | | | | | |
| WS042312 | 1247 | 1281 | 1270 | | | | 1008 | | 1055 | | 1055 | 995 | | 1022 | 3169 | 1971 | 1084 | 1491 |
| | | | | | | | | | | | | | | | | | | |
| WS050712 | Not in SAP | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | 2848 | 3400 | 863 | 914 |
| WS052112 | 3881 | 1319 | 1149 | | 1470 | | 1272 | | 1221 | | 1864 | 1870 | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| WS060412 | Not in SAP | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| WS061812 | 3193 | 2630 | 2168 | 2166 | 1853 | | 2058 | | 2320 | 2926 | | | | | 2412 | 9631 | 1143 | 1171 |
| WS060611 | 745 | 742 | 723 | | 740 | 690 | 664 | 705 | 545 | 642 | 541 | | 543 | 488 | 739 | 752 | | 751 |

# Specific Conductance-cont.

| | SP.cond (µS/cm) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |
| Date | | | | | | | | | | | | |
| | HC-WMA-BYPASS-N | HC-WMA-1N | HC-WMA-2N | HC-WMA-5N | HC-WMA-5NZ | HC-WMA-7N | HC-WMA-8N | HC-WMA-9N | HC-WMA-11N | HC-WMA-12N | HC-WMA-13N | HC-WMA-14N |
| | | | | | | | | | | | | |
| WS042312 | 2357 | 4989 | 5206 | | | | 5715 | 6207 | | 6671 | | 6512 |
| | | | | | | | | | | | | |
| WS050712 | 2876 | 5407 | 5592 | | | | 5045 | 6305 | | 6312 | | |
| | | | | | | | | | | | | |
| WS052112 | 2384 | 4192 | 4429 | 4795 | 4852 | | 3402 | | | 5518 | | 4451 |
| | | | | | | | | | | | | |
| WS060412 | 3040 | 3676 | 3655 | 4472 | 4473 | 4601 | 4109 | | 4175 | 4161 | 4160 | 4162 |
| | | | | | | | | | | | | |
| WS061812 | 2634 | 2651 | 4943 | | | | 3217 | | 4768 | 4606 | | 3938 |

| Date | HC-WMA-1 | HC-WMA-2 | HC-WMA-3 | HC-WMA-5 |
|---|---|---|---|---|
| WS060412 | 2538 | 2260 | 2259 | 2536 |
| WS06062011 | | | 11369 | 4414 |
| | | | | |
| WS061812 | 4032 | 2497 | 2491 | 2533 |
| WS07052011 | 7472 | 3151 | | 2626 |

# Specific Conductance-cont.

| | SP.cond (µS/cm) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | |
| Date | | | | | | | | | | | | | |
| | BRR-1 | BRR-2 | BRR-3 | BRR-4 | BRR-7 | BRR-8 | BRR-10 | BRR-10Z | BRR-11 | WB-RES-N-OUTLET | MZ-IN-TAILRACE | IRRIGATION-RF1 | WP-OUTFALL |
| | | | | | | | | | | | | | |
| WS042312 | 9892 | 12324 | | 1035 | 2467 | 1024 | 1146 | 1147 | 1198 | 801 | 923 | | |
| WS04272011 | | | 5855 | 713 | 3677 | 687 | 791 | | 662 | | | | |
| | | | | | | | | | | | | | |
| WS050712 | | 14308 | | | | 1074 | 1236 | 1241 | 975 | 809 | 865 | 832 | 970 |
| WS05112011 | 6147 | | 5937 | 606 | 3518 | | 572 | 604 | 326 | | | | |
| WS052112 | 12100 | 15148 | 17975 | 1953 | | 1909 | | | | 806 | 824 | 1181 | 1181 |
| WS052311 | | | | 549 | | 567 | 725 | 698 | 879 | | | 785 | 509 |
| | | | | | | | | | | | | | |
| WS060412 | 11186 | 17719 | 16249 | 1039 | 3624 | 1496 | 1610 | 1611 | 2231 | 828 | 842 | 3254 | 910 |
| WS069062011 | | 10337 | | 592 | 2998 | 582 | 690 | 694 | 601 | | | | |
| | | | | | | | | | | | | | |
| WS061812 | 10262 | 14811 | 11349 | 3564 | 4276 | 4314 | | | | 877 | 1042 | 4649 | 983 |
| WS06212011 | | | | 512 | | 527 | | | 974 | 658 | | | 903 |

Questions??

Thanks!!!