# Micron Area Plan

# Storm Drainage

## Design Criteria:

| | |
|---|---|
| West Parcel | All areas to detain and release per the Storm Drain Outfall Summary shown on sheet SD-1.9. A 100 year, 24 hour storm to be used for sizing detention areas and a 10 year, 24 hour storm to be used for pipe sizing. Refer to Appendix A for Lehi City Allowable Flow Rate map, SR-92 Drainage Exhibit, and rainfall IDF curves prepared by MW Brown Engineering. |
| No sumps to be used | |
| Minimum pipe size: | 12" |
| Pipe Type: | ADS for pipes less than 24" and three feet or more cover<br>RCP for pipes less than 24" and less than three feet of cover<br>RCP for pipes 24" and larger (refer to Lehi City Design Standards Section 9.07) |

## Summary of Results:

| | |
|---|---|
| West Parcel: | Stantec Consulting was retained by Micron to study storm drainage for this area and has provided much of the base model information. LEI has used this model with minor updates for this study. Refer to sheets SD-1.2 through SD-1.9 for the model inputs and results of this study. Refer to Appendix B for Stantec Consulting exhibits. |
| | Storm water will be conveyed to thirteen detention ponds within the area. Four of the ponds are existing and may need to be modified to accommodate additional storm drainage from the Micron area. Refer to sheet SD-1.4 for specific capacity information. |

# MICRON AREA PLAN

## Storm Drain Model Summary - West Side

| Pond | Contributing Sub-basin/Pond | Contributing Area | Peak Inflow to Pond | Pond Volume | Peak Discharge | Discharge Point |
|---|---|---|---|---|---|---|
| Direct Discharge | 1A | 151.0 | N/A | N/A | 24.5 | UDOT 1&2 |
| | 1B | 49.5 | N/A | N/A | | |
| | 1C | 82.3 | N/A | N/A | | |
| | 1D | 95.2 | N/A | N/A | | |
| | 2 | 7.8 | N/A | N/A | | |
| Pond 3-4 | 3 | 33.7 | 84.3 | 3.9 | 30.4 | UDOT 3 |
| | 4 | 66.5 | | | | |
| Upper Pond 5 | 5 | 84.5 | 89.1 | 4.0 | 30.4 | Lower Pond 5 |
| Lower Pond 5 | Upper Pond 5 | N/A | 30.4 | 1.4 | 19.1 | UDOT 4 |
| Pond 6 | 6 | 12.8 | 19.2 | 0.5 | 13.6 | UDOT 5 |
| Existing Pond 7 | Pond 7-1 | N/A | 95.6 | 8.6 | 49.3 | UDOT 6 |
| Pond 7-1 | Pond 7-2 | N/A | 139.4 | 3.7 | 95.6 | Pond 7 |
| | 7D | 102.7 | | | | |
| Pond 7-2 | Pond 7-3 | N/A | 81.9 | 2.5 | 67.3 | Pond 7-1 |
| Pond 7-3 | West Dam | N/A | 82.3 | 1.9 | 81.9 | Pond 7-2 |
| Existing West Dam Detention Pond | Pond 7-4 | N/A | 126.7 | 6.3 | 82.8 | Pond 7-3 |
| | Pond 7-5 | | | | | |
| Pond 7-4 | 7A | N/A | 117.5 | 4.0 | 62.9 | West Dam |
| | 7C West | | | | | |
| Pond 7-5 | 7B | 166.5 | 147.0 | 5.3 | 68.0 | West Dam |
| | 7C East | N/A | | | | |
| Existing Pond 8 | 8 | 24.3 | 33.8 | 1.0 | 17.6 | UDOT 7 |
| Existing Pond 9 | 9 | 24.7 | 44.9 | 2.1 | 5.0 | UDOT 8 |

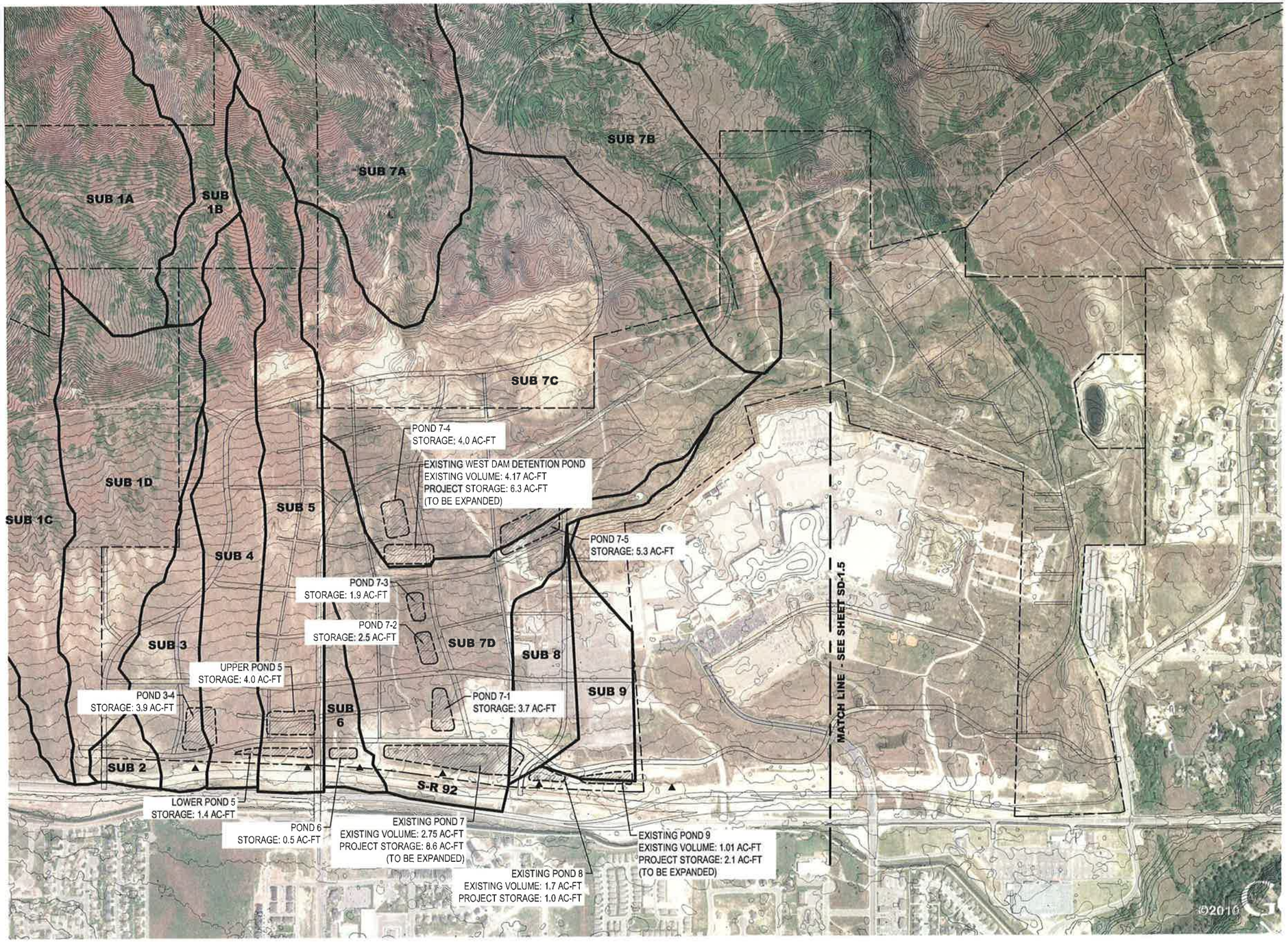
1. See sheets 1.4 and 1.5 for pond locations

# MICRON AREA PLAN

## Storm Drain Piping Calculations - West Side

| Area Inlet | Area Discharge (cfs) | Min. Slope % | Pipe Diameter (in) | Capacity | |
|---|---|---|---|---|---|
| A-1 | 11.20 | 3.10% | 15 | **11.37** | OK |
| B-1 | 51.20 | 5.20% | 24 | **51.57** | OK |
| B-2 | 36.40 | 5.30% | 21 | **36.47** | OK |
| B-3 | 23.70 | 5.10% | 18 | **23.71** | OK |
| B-4 | 11.70 | 3.30% | 15 | **11.73** | OK |
| C-1 | 69.90 | 3.00% | 30 | **71.02** | OK |
| C-2 | 51.70 | 5.30% | 24 | **52.06** | OK |
| C-3 | 21.20 | 4.10% | 18 | **21.26** | OK |
| D-1 | 30.20 | Exist Open Channel | | | |
| D-2 | 5.50 | Exist Open Channel | | | |
| E-1 | 66.30 | 2.70% | 30 | **67.37** | OK |
| E-2 | 36.10 | 3.30% | 24 | **41.08** | OK |
| E-3 | 11.20 | 3.10% | 15 | **11.37** | OK |
| F-1 | 62.70 | 2.35% | 30 | **62.86** | OK |
| F-2 | 37.90 | 5.80% | 21 | **38.15** | OK |
| F-3 | 18.10 | 3.00% | 18 | **18.19** | OK |

1. Pipe flow and sizing is based on the conceptual plan and may be adjusted with final design.
2. Pipe sizing based on a 10 year storm.




▲ DISCHARGE POINTS TO UDOT SYSTEM, SEE A AND B APPENDICES.

NORTH

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**MICRON CRON**
LEHI, UTAH

# STORM DRAIN PLAN - WEST

REVISIONS
1 -
2 -
3 -
4 -
5 -

LEI PROJECT #: 2011-0066
DRAWN BY: RWH
DESIGNED BY: BTG
SCALE: 1" = 1000'
DATE: 06/30/2011

SHEET
**SD-1.4**

| DISCHARGE TO UDOT | |
|---|---|
| LOCATION | DISCHARGE |
| 1&2 | 24.5 CFS |
| 3 | 30.4 CFS |
| 4 | 19.1 CFS |
| 5 | 13.6 CFS |
| 6 | 49.3 CFS |
| 7 | 17.6 CFS |
| 8 | 5.0 CFS |

1.6 cfs
OPEN CHANNEL
B-4
15"
B-3
18"
B-2
21"
B-1
24"
A-1
C-3
18"
C-2
24"
C-1
30"
E-3
15"
E-2
24"
EXISTING OPEN CHANNEL
D-1
30"
E-1
B-1
F-3
18"
F-2
21"
F-1
30"
POND 7-4
STORAGE: 4.0 AC-FT
WEST DAM DETENTION
POND 6.3 AC-FT
62.9 cfs
66.0 cfs
82.8 cfs
POND 7-5
STORAGE: 5.3 AC-FT
POND 7-3
STORAGE: 1.9 AC-FT
81.9 cfs
POND 7-2
STORAGE: 2.5 AC-FT
67.3 cfs
POND 7-1
STORAGE: 3.7 AC-FT
95.6 cfs
POND 7
STORAGE: 8.6 AC-FT
POND 3-4
STORAGE: 3.9 AC-FT
UPPER POND 5
STORAGE: 4.0 AC-FT
LOWER POND 5
STORAGE: 1.4 AC-FT
POND 6
STORAGE: 0.5 AC-FT
POND 8
STORAGE: 1.0 AC-FT
POND 9
STORAGE: 2.1 AC-FT
1
2
3
4
5
6
7
8
S-R 92
MATCH LINE - SEE SHEET SD-2.5
▲ UDOT DISCHARGE POINT


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**MICRON**
LEHI, UTAH

# STORM DRAIN PIPING PLAN - WEST

REVISIONS
1 -
2 -
3 -
4 -
5 -

LEI PROJECT #: 2011-0066
DRAWN BY: RWH
DESIGNED BY: BTG
SCALE: 1" = 600'
DATE: 06/30/2011

SHEET
**SD-1.5**

# MICRON AREA PLAN

## Lehi City Allowable Discharge Calculation - West Side

| Sub-basin | Total Drainage Area (Acres) | Release Rate Areas | | | | Allowable Flow (cfs) |
|---|---|---|---|---|---|---|
| | | 0.1 cfs/acre (Acres) | 0.2 cfs/acre (Acres) | 0.05 cfs/acre (Acres) | Direct Flow[1] (Acres) | |
| 1A | 151.0 | 139.9 | 11.1 | 0.0 | 0.0 | 16.2 |
| 1B | 49.5 | 44.9 | 4.6 | 0.0 | 0.0 | 5.4 |
| 1C | 82.3 | 12.2 | 41.3 | 0.0 | 28.8 | 15.2 |
| 1D | 95.2 | 0.0 | 77.0 | 0.0 | 18.2 | 19.0 |
| 2 | 7.8 | 0.0 | 7.8 | 0.0 | 0.0 | 1.6 |
| 3 | 33.7 | 0.0 | 33.7 | 0.0 | 0.0 | 6.7 |
| 4 | 66.5 | 3.5 | 63.0 | 0.0 | 0.0 | 12.9 |
| 5 | 84.5 | 19.3 | 65.2 | 0.0 | 0.0 | 15.0 |
| 6 | 12.8 | 0.0 | 12.8 | 0.0 | 0.0 | 2.6 |
| 7A | 358.5 | 358.5 | 0.0 | 0.0 | 0.0 | 35.9 |
| 7B | 166.5 | 150.5 | 16.0 | 0.0 | 0.0 | 18.3 |
| 7C | 242.9 | 129.9 | 113.0 | 0.0 | 0.0 | 35.6 |
| 7D | 102.7 | 0.0 | 102.7 | 0.0 | 0.0 | 20.5 |
| 8 | 24.3 | 0.0 | 24.3 | 0.0 | 0.0 | 4.9 |
| 9 | 24.7 | 0.0 | 24.7 | 0.0 | 0.0 | 4.9 |
| Totals | 1,502.9 | 858.7 | 597.2 | 0.0 | 47.0 | 214.7 |

1. Direct flow is calculated assuming undeveloped flows at 0.2 cfs/acre.

# MICRON AREA PLAN

**CN Value Calculations - West Side**

| | HSG | Landuse | SCS Curve Number | Sub-basin | Area (acres) | Total Area (ac) | Area Weighted CN |
|---|---|---|---|---|---|---|---|
| Sub 1A | A | Gambel Oak | 40 | Sub 1A | 116.00 | | |
| | D | Gambel Oak | 77 | Sub 1A | 35.00 | | |
| | | | | | | 151.00 | 49 |
| Sub 1B | A | Gambel Oak | 40 | Sub 1B | 33.50 | | |
| | D | Gambel Oak | 77 | Sub 1B | 16.00 | | |
| | | | | | | 49.50 | 52 |
| Sub 1C | A | Sagebrush/Grassland | 63 | Sub 1C | 48.80 | | |
| | B | Sagebrush/Grassland | 63 | Sub 1C | 22.17 | | |
| | C | Sagebrush/Grassland | 71 | Sub 1C | 11.30 | | |
| | | | | | | 82.27 | 64 |
| Sub 1D | A | Sagebrush/Grassland | 48 | Sub 1D | 44.60 | | |
| | B | Sagebrush/Grassland | 63 | Sub 1D | 10.81 | | |
| | C | Sagebrush/Grassland | 71 | Sub 1D | 16.00 | | |
| | D | Sagebrush/Grassland | 81 | Sub 1D | 5.00 | | |
| | B | Multi-Family Housing | 85 | Sub 1D | 16.3 | | |
| | B | Office | 92 | Sub 1D | 2.53 | | |
| | | | | | | 95.24 | 63 |
| Sub 2 | B | Grassland | 69 | Sub 2 | 1.03 | | |
| | B | Office | 92 | Sub 2 | 2.57 | | |
| | D | Open Space | 69 | Sub 2 | 4.20 | | |
| | | | | | | 7.80 | 77 |
| Sub 3 | B | Office | 92 | Sub 3 | 7.75 | | |
| | B | Multi-Family Housing | 85 | Sub 3 | 15.60 | | |
| | D | Open Space | 80 | Sub 3 | 10.35 | | |
| | | | | | | 33.70 | 85 |
| Sub 4 | D | Grassland | 84 | Sub 4 | 3.30 | | |
| | B/D | Multi-Family Housing | 90 | Sub 4 | 1.70 | | |
| | B | School | 70 | Sub 4 | 1.50 | | |
| | B/D | Retail/Mixed Use | 94 | Sub 4 | 19.50 | | |
| | D | Office | 95 | Sub 4 | 7.80 | | |
| | B/D | Open Space | 74 | Sub 4 | 32.70 | | |
| | | | | | | 66.50 | 83 |
| Sub 5 | A | Grassland | 61 | Sub 5 | 5.20 | | |
| | D | Grassland | 84 | Sub 5 | 12.00 | | |
| | B/D | Multi-Family Housing | 90 | Sub 5 | 7.10 | | |
| | B/D | School | 80 | Sub 5 | 11.80 | | |
| | B/D | Retail/Mixed Use | 94 | Sub 5 | 15.80 | | |
| | B/D | Office | 94 | Sub 5 | 22.40 | | |
| | B/D | Open Space | 74 | Sub 5 | 10.20 | | |
| | | | | | | 84.50 | 86 |
| Sub 6 | B/D | Office | 94 | Sub 6 | 2.90 | | |
| | B/D | Retail/Mixed Use | 94 | Sub 6 | 5.80 | | |
| | B/D | Open Space | 74 | Sub 6 | 4.10 | | |
| | | | | | | 12.80 | 88 |
| Sub 7A | A | Gambel Oak | 48 | Sub 7A | 325.00 | | |
| | D | Gambel Oak | 83 | Sub 7A | 25.70 | | |
| | D | Single Family Housing | 85 | Sub 7A | 6.80 | | |
| | | | | | | 357.50 | 51 |

| | HSG | Landuse | SCS Curve Number | Sub-basin | Area (acres) | Total Area (ac) | Area Weighted CN |
|---|---|---|---|---|---|---|---|
| Sub 7B | A | Open Space | 39 | Sub 7B | 37.00 | | |
| | B | Open Space | 61 | Sub 7B | 25.00 | | |
| | D | Open Space | 80 | Sub 7B | 24.00 | | |
| | A | Single Family Housing | 54 | Sub 7B | 28.00 | | |
| | C | Single Family Housing | 80 | Sub 7B | 13.50 | | |
| | D | Single Family Housing | 85 | Sub 7B | 39.00 | | |
| | | | | | | 166.50 | 65 |
| Sub 7C | B | Multi-Family Housing | 85 | Sub 7C | 38.90 | | |
| | B/D | Office | 95 | Sub 7C | 62.90 | | |
| | B/D | School | 85 | Sub 7C | 4.30 | | |
| | B/D | Public | 75 | Sub 7C | 9.30 | | |
| | B | Light Industrial | 88 | Sub 7C | 21.00 | | |
| | B/D | Open Space | 80 | Sub 7C | 95.60 | | |
| | D | Single Family Housing | 85 | Sub 7C | 10.90 | | |
| | | | | | | 242.90 | 85 |
| Sub 7D | B | Office | 92 | Sub 7D | 50.60 | | |
| | B/D | Retail/Mixed Use | 94 | Sub 7D | 29.40 | | |
| | B/D | Open Space | 80 | Sub 7D | 22.70 | | |
| | | | | | | 102.70 | 90 |
| Sub 8 | B | Office | 92 | Sub 8 | 20.10 | | |
| | B | Light Industrial | 88 | Sub 8 | 2.20 | | |
| | B | Open Space | 61 | Sub 8 | 2.00 | | |
| | | | | | | 24.30 | 89 |
| Sub 9 | B/D | Office | 94 | Sub 9 | 11.70 | | |
| | B/D | Light Industrial | 91 | Sub 9 | 10.70 | | |
| | B/D | Open Space | 74 | Sub 9 | 2.30 | | |
| | | | | | | 24.70 | 91 |

# MICRON AREA PLAN

## Storm Drain Outfall Summary - West Side

| Sub-basin | Drainage Area (Acres) | Allowable Discharge[1] (cfs) | UDOT SR-92 Limiting Storm Drain Capacity[2] (cfs) | Model Discharge[3] (cfs) |
|---|---|---|---|---|
| 1 | 378.0 | 55.9 | 40.6 | |
| 2 | 7.8 | 1.6 | 19.2 | |
| 1&2 | 385.8 | 57.5 | | 24.5 |
| 3 | 33.7 | 6.7 | 30.7 | |
| 4 | 66.5 | 12.9 | 19.2 | |
| 3&4 | 100.2 | 19.7 | 30.7 | 30.4 |
| 5 | 84.5 | 15.0 | 19.2 | 19.1 |
| 6 | 12.8 | 2.6 | 13.6 | 13.6 |
| 7 | 870.6 | 110.2 | 49.5 | 49.3 |
| 8 | 24.3 | 4.9 | 17.7 | 17.6 |
| 9 | 24.7 | 4.9 | 50.4 | 4.9 |
| Totals | | 214.7 | 241 | 159.4 |

1. Allowable discharge is based on the the Lehi City Allowable Flow Rate Map prepared by MW Brown Engineering included in Appendix A. See sheet SD1.3 for calculations.
2. UDOT SR-92 limiting capacity is based on calculations from Stantec on the existing storm drain piping installed by UDOT in SR-92.
3. Model discharge is the system discharge per the Stantec HEC-HMS model.

## Design Criteria:

East Parcel — All areas to detain and release per the Storm Drain Outfall Summary shown on sheet SD-2.6. A 100 year, 24 hour storm to be used for sizing detention areas and a 10 year, 24 hour storm to be used for pipe sizing. Refer to Appendix A for rainfall IDF curves prepared by MW Brown Engineering.

No sumps to be used

Minimum pipe size: 12"

Pipe Type: ADS for pipes less than 24" and three feet or more cover
RCP for pipes less than 24" and less than three feet of cover
RCP for pipes 24" and larger (refer to Lehi City Design Standards Section 9.07)

## Summary of Results:

East Parcel: Storm water will be conveyed to three detention ponds. Two of the ponds are existing and will be modified to accommodate additional storm drainage from the Micron area. Refer to sheets SD-2.2 and 2.3 for a summary of pond and pipe sizing calculations.

It is unknown at this time how much storage in Existing Pond 11 is allocated for the IM Flash site and will need to be provided with the preliminary plans. If additional storage is required, the existing pond will be modified.

The existing pond and outlet for Pond 12 was modeled assuming developed conditions within the area plan and undeveloped conditions for upstream areas within the sub-basin. The existing pond will accommodated the anticipated flows and no modifications are necessary.

# MICRON AREA PLAN

## Storm Drain Model Summary - East Side

| Pond | Contributing Sub-basin/Pond | Contributing Area | Peak Inflow to Pond | Pond Volume | Peak Discharge | Discharge Point |
|---|---|---|---|---|---|---|
| Pond 11 | 11 | 47.2 | 73.8 | 3.2 | 9.5 | Existing |
| Pond 12 | 12 | 1,220.6 | 194.3 | 16.2 | 74.3 | Existing |
| Pond 13 | 13 | 307.8 | 83.2 | 3.8 | 38.1 | Dry Creek |

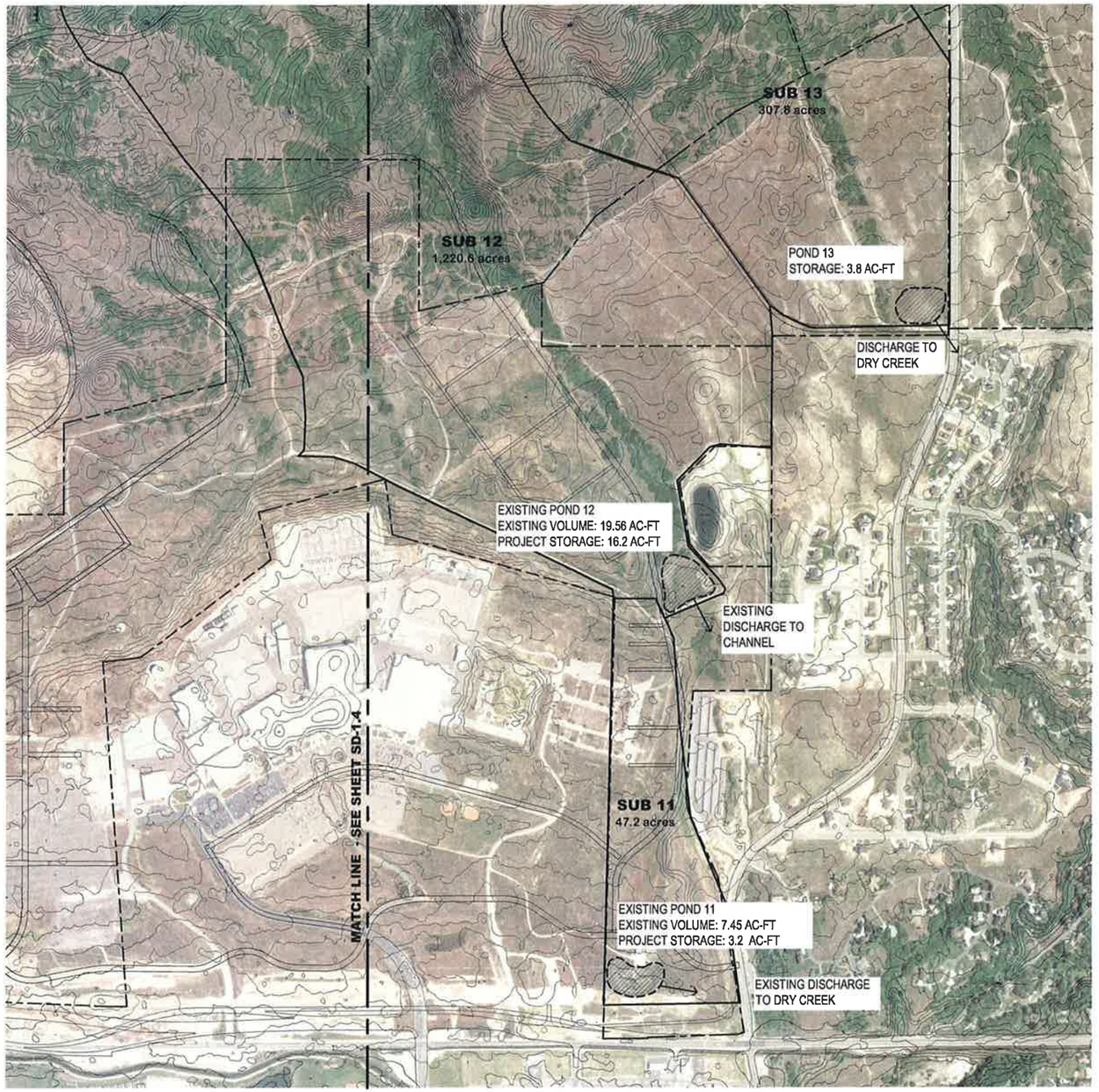
1. See sheets 2.4 and 2.5 for pond locations

# MICRON AREA PLAN

## Storm Drain Piping Calculations - East Side

| Area Inlet | Area Discharge (cfs) | Min. Slope % | Pipe Diameter (in) | Capacity | |
|---|---|---|---|---|---|
| G1 | 43.50 | 3.80% | 24 | **44.08** | OK |
| G2 | 28.00 | 3.20% | 21 | **28.33** | OK |
| G-3 | 15.60 | 2.30% | 18 | **15.92** | OK |
| H-1 | 18.50 | Exist Open Channel | | | |
| I-1 | 52.90 | 1.70% | 30 | **53.46** | OK |
| I-2 | 48.70 | 4.70% | 24 | **49.03** | OK |
| I-3 | 38.20 | 5.90% | 21 | **38.47** | OK |
| I-4 | 24.60 | 5.50% | 18 | **24.63** | OK |
| J-1 | 22.50 | 2.10% | 21 | **22.95** | OK |
| J-2 | 11.60 | 1.30% | 18 | **11.97** | OK |
| K-1 | 48.10 | 1.40% | 30 | **48.51** | OK |
| K-2 | 27.70 | 1.60% | 24 | **28.61** | OK |
| K-3 | 16.90 | 2.60% | 18 | **16.93** | OK |

1. Pipe flow and sizing is based on the conceptual plan and may be adjusted with final design.
2. Pipe sizing based on a 10 year storm.

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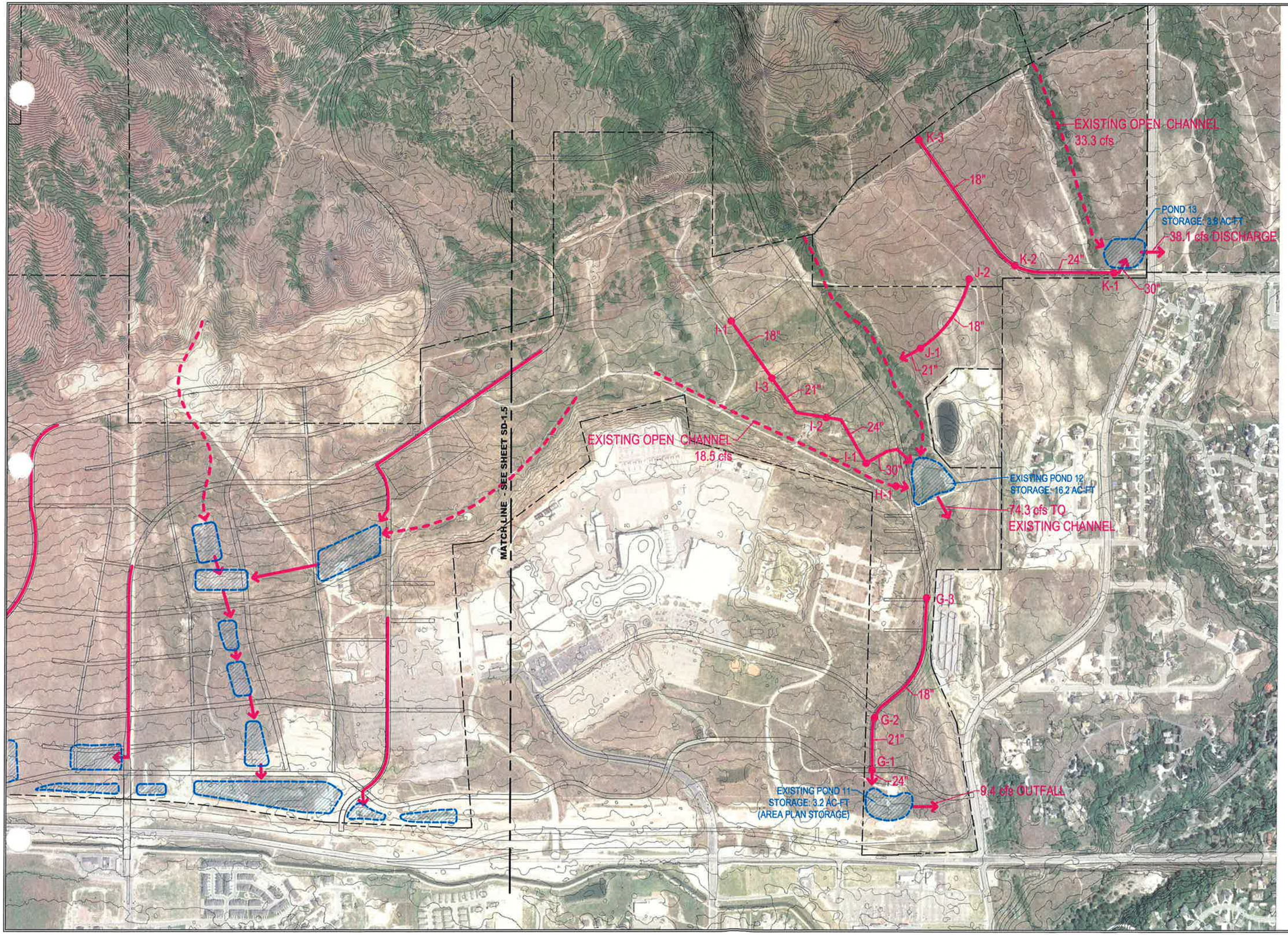
MICRON
LEHI, UTAH

# STORM DRAIN PLAN - EAST

REVISIONS
1 -
2 -
3 -
4 -
5 -

LEI PROJECT #: 2011-0066
DRAWN BY: RWH
DESIGNED BY: BTG
SCALE: 1" = 1000'
DATE: 06/30/2011

SHEET
SD-2.4

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MICRON
LEHI, UTAH

# STORM DRAIN PIPING PLAN - EAST

REVISIONS
1 -
2 -
3 -
4 -
5 -

LEI PROJECT #: 2011-0066
DRAWN BY: RWH
DESIGNED BY: BTG
SCALE: 1" = 600'
DATE: 06/30/2011

SHEET
SD-2.5

# MICRON AREA PLAN

## Lehi City Allowable Discharge Calculation - East Side

| Sub-basin | Total Drainage Area (Acres) | Release Rate Areas | | Allowable Flow (cfs) | Model Discharge (cfs) |
|---|---|---|---|---|---|
| | | 0.1 cfs/acre (Acres) | 0.2 cfs/acre (Acres) | | |
| 11 | 47.2 | 0.0 | 47.2 | 9.4 | 9.4 |
| 12 | 1,220.6 | 1,031.2 | 189.4 | 141.0 | 74.3 |
| 13 | 307.8 | 228.0 | 79.8 | 38.8 | 38.1 |
| Totals | 1,575.6 | 1,259.2 | 316.4 | 189.2 | 121.8 |

1. Model Discharge for Sub-basin 12 is based on the existing outlet structure.

# MICRON AREA PLAN

**CN Value Calculations - East Side**

| | HSG | Landuse | SCS Curve Number | Area (acres) | Total Area (ac) | Area Weighted CN |
|---|---|---|---|---|---|---|
| Sub 11 | B | Office | 92 | 30.42 | | |
| | D | Office | 95 | 16.80 | | |
| | | | | | 47.22 | 93 |
| Sub 12 | A | Gamble Oak | 48 | 45.57 | | |
| | B | Gamble Oak | 60 | 41.47 | | |
| | B | Sagebrush/Grassland | 63 | 60.56 | | |
| | B | Office | 92 | 23.28 | | |
| | B | Single-Family Housing | 75 | 14.75 | | |
| | C | Gamble Oak/Grassland | 71 | 841.98 | | |
| | D | Office | 95 | 9.98 | | |
| | D | Sagebrush/Grassland | 81 | 148.46 | | |
| | D | Single-Family Housing | 87 | 34.575 | | |
| | | | | | 1220.62 | 72 |
| Sub 13 | B/D | School | 85 | 8.56 | | |
| | B | Sagebrush/Grassland | 71 | 44.62 | | |
| | B | Single-Family Housing | 75 | 11.86 | | |
| | C | Gamble Oak/Grassland | 71 | 131.06 | | |
| | D | Single-Family Housing | 87 | 33.50 | | |
| | D | Sagebrush/Grassland | 81 | 78.18 | | |
| | | | | | 307.77 | 76 |

# Appendix A: Lehi City Reference Material

SCALE (FEET)
0 900 1800 2700 3600

72" STORM DRAIN ALLOWABLE FLOW RATES

- CONTRIBUTING AREA (SR-92) DIRECT FLOW (120 ACRES)
- MURDOCK CANAL (FULL RETENTION)
- RAILROAD R-O-W (EXISTING FLOW) (62 ACRES)
- I-15 (DIRECT FLOW)
- BULL RIVER DITCH SR-92 @ STA. DIRECT FLOW ALLOCATIONS LEHI CITY & NORTH BENCH IRRI. (26 CFS)
- CONTRIBUTING AREA (LEHI) (630 ACRES) (0.2 CFS PER ACRE)
- CONTRIBUTING AREA (DRAPER) (398 ACRES) (0.1 CFS PER ACRE)
- CONTRIBUTING AREA (UTAH COUNTY) (450 ACRES) (0.1 CFS PER ACRE)
- TRAVERSE MTN. (DIRECT FLOW) (872 ACRES)
- LEHI CITY (DETAINED FLOW) (43 ACRES) (0.05 CFS PER ACRE)
- DRAINAGE SYSTEM

TRAVERSE MOUNTAIN DETAINED FLOWS TO EXISTING 60" CULVERT

UTAH COUNTY
450 ACRES
0.1 CFS PER ACRE

DRAPER CITY
405 ACRES
0.1 CFS PER ACRE

LEHI CITY
630 ACRES
0.2 CFS PER ACRE

TRAVERSE MOUNTAIN
872 ACRES
DIRECT FLOW

MICRON EXIST. DETENTION PONDS

EXISTING 60" CULVERT

DETENTION AREA

MURDOCK CANAL

RAILROAD R-O-W

I-15

SR-92

BULL RIVER DITCH

DRAPER CITY LIMITS

LEHI CITY LIMITS

SALT LAKE CO. LIMITS
UTAH CO. LIMITS

MW BROWN ENGINEERING, INC
Office: (801) 377-1790 Fax: (801) 377-1789
578 East 770 North, Orem UT 84097

REVISIONS
No. | Date | By | Notes

Designed: D.A. BUFFO
Drawn: M.W. BROWN
Checked:
Date: JANUARY 27, 2010

TITLE: EXHIBIT "A"
Client: LEHI CITY ALLOWABLE FLOW RATE
DATE: FEBRUARY 2011

PROJECT NO. 2008.070

SHEET NO. 1

REVISIONS

| NO. | DATE | APPROVED BY | REMARKS |
|---|---|---|---|
| | | | |

DRAWN BY

QC CHECKED BY

DATE

PROFESSIONAL ENGINEER

**UTAH DEPARTMENT OF TRANSPORTATION**
ROADWAY DESIGN

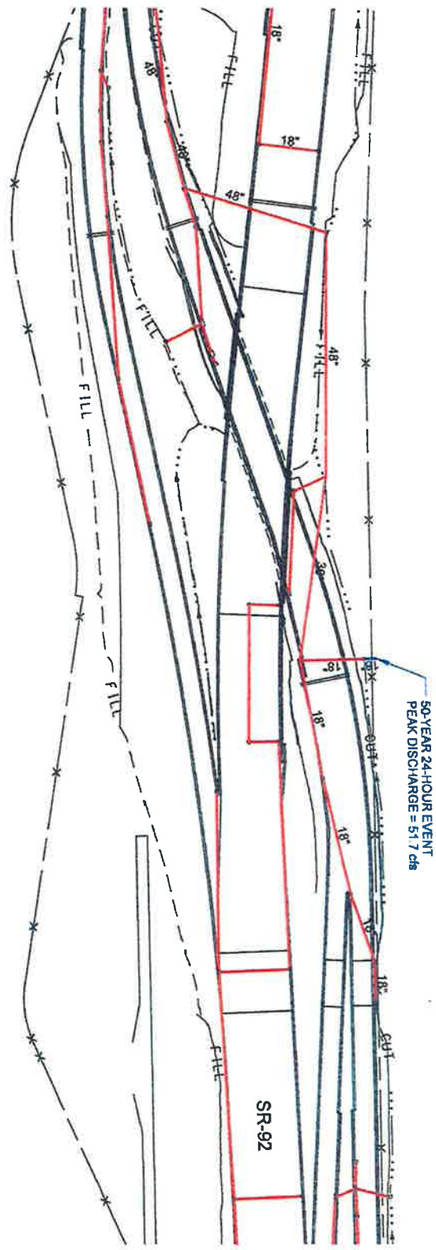
APPROVED

| | |
|---|---|
| PROJECT | UTAH COUNTY ACCESS MANAGEMENT<br>SR-92, LEHI TO HIGHLAND |
| PROJECT NUMBER | F-0092(12)1 |
| | DRAINAGE EXHIBIT |

SHEET NO. DR-07


| | | | |
|---|---|---|---|
| SHEET NO. DR-08 | PROJECT: UTAH COUNTY ACCESS MANAGEMENT | UTAH DEPARTMENT OF TRANSPORTATION | REVISIONS |
| | SR-92, LEHI TO HIGHLAND | ROADWAY DESIGN | |
| | PROJECT NUMBER: F-0092(12)1 | APPROVED | DRAWN BY |
| | DRAINAGE EXHIBIT | PROFESSIONAL ENGINEER — DATE | QC CHECKED BY |
| | | | NO. DATE APPROVED BY REMARKS |

SEE SHEET DR-09




OWNERSHIP AND OPERATION OF MAINTENANCE

UDOT

LEHI CITY

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FEET

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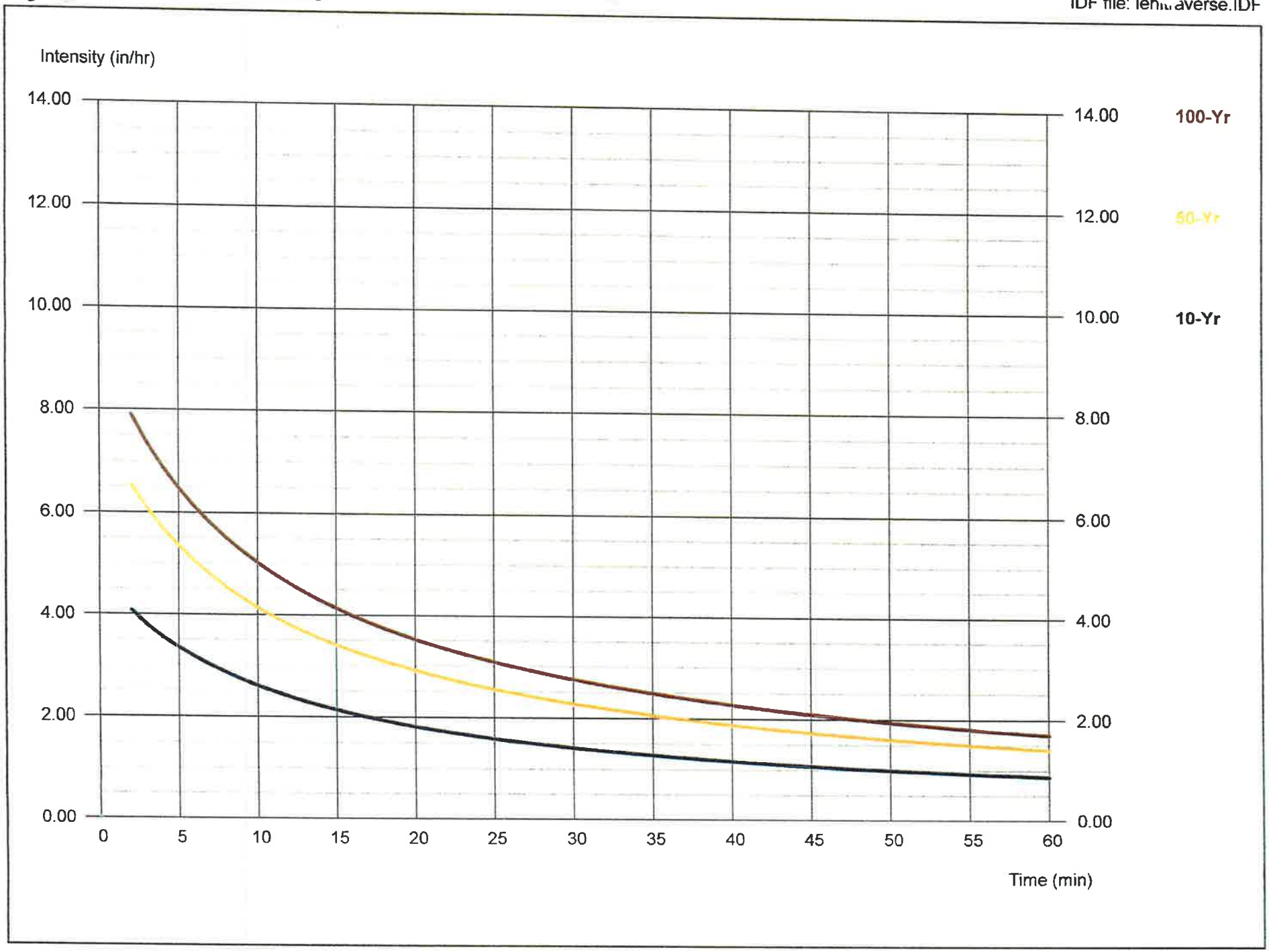
| | | | | |
|---|---|---|---|---|
| SHEET NO. DR-09 | PROJECT | UTAH COUNTY ACCESS MANAGEMENT | UTAH DEPARTMENT OF TRANSPORTATION | REVISIONS |
| | | SR-92, LEHI TO HIGHLAND | ROADWAY DESIGN | |
| | PROJECT NUMBER | F-0092(12)1 | APPROVED | DRAWN BY |
| | DRAINAGE EXHIBIT | | PROFESSIONAL ENGINEER DATE | QC CHECKED BY |

| NO. | DATE | APPROVED BY | REMARKS |
|---|---|---|---|
| | | | |

# Hydraflow IDF Curves

IDF file: lehmaverse.IDF



# Hydraflow Rainfall Report

Hydraflow Hydrographs by Intelisolve v9.23

Friday, Apr 22, 2011

| Return Period (Yrs) | Intensity-Duration-Frequency Equation Coefficients (FHA) | | | |
|---|---|---|---|---|
| | B | D | E | (N/A) |
| 1 | 0.0000 | 0.0000 | 0.0000 | -------- |
| 2 | 0.0000 | 0.0000 | 0.0000 | -------- |
| 3 | 0.0000 | 0.0000 | 0.0000 | -------- |
| 5 | 0.0000 | 0.0000 | 0.0000 | -------- |
| 10 | 32.9029 | 9.5000 | 0.8549 | -------- |
| 25 | 0.0000 | 0.0000 | 0.0000 | -------- |
| 50 | 47.9118 | 8.9000 | 0.8330 | -------- |
| 100 | 61.8434 | 9.3000 | 0.8479 | -------- |

File name: lehitraverse.IDF

**Intensity = B / (Tc + D)^E**

| Return Period (Yrs) | Intensity Values (in/hr) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 5 min | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 |
| 1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10 | 3.34 | 2.60 | 2.14 | 1.82 | 1.59 | 1.42 | 1.28 | 1.17 | 1.08 | 1.00 | 0.93 | 0.88 |
| 25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 50 | 5.35 | 4.14 | 3.41 | 2.91 | 2.55 | 2.27 | 2.05 | 1.88 | 1.73 | 1.61 | 1.50 | 1.41 |
| 100 | 6.48 | 5.03 | 4.13 | 3.53 | 3.09 | 2.75 | 2.48 | 2.27 | 2.09 | 1.94 | 1.81 | 1.70 |

Tc = time in minutes. Values may exceed 60.

Precip. file name: Lehitraverse.pcp

| Storm Distribution | Rainfall Precipitation Table (in) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1-yr | 2-yr | 3-yr | 5-yr | 10-yr | 25-yr | 50-yr | 100-yr |
| SCS 24-hour | 1.08 | 1.33 | 0.00 | 1.58 | 1.79 | 2.08 | 2.30 | 2.52 |
| SCS 6-Hr | 0.76 | 0.94 | 0.00 | 1.14 | 1.32 | 1.58 | 1.82 | 2.07 |
| Huff-1st | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Huff-2nd | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Huff-3rd | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Huff-4th | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Huff-Indy | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Custom | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

NOAA Atlas 14, Volume 1, Version 5
Location name: Lehi, Utah, US*
Coordinates: 40.4373, -111.8674
Elevation: 4978ft*
* source: Google Maps

## POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

## PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

| Duration | Average recurrence interval(years) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 5 | 10 | 25 | 50 | 100 | 200 | 500 | 1000 |
| 5-min | 0.128 (0.112-0.148) | 0.162 (0.143-0.188) | 0.223 (0.195-0.259) | 0.279 (0.241-0.324) | 0.366 (0.308-0.429) | 0.447 (0.366-0.528) | 0.541 (0.430-0.647) | 0.652 (0.499-0.792) | 0.830 (0.602-1.03) | 0.992 (0.689-1.26) |
| 10-min | 0.195 (0.171-0.226) | 0.247 (0.217-0.287) | 0.339 (0.297-0.394) | 0.424 (0.366-0.493) | 0.557 (0.469-0.652) | 0.681 (0.558-0.804) | 0.824 (0.655-0.984) | 0.993 (0.760-1.21) | 1.26 (0.917-1.57) | 1.51 (1.05-1.92) |
| 15-min | 0.242 (0.212-0.280) | 0.306 (0.270-0.355) | 0.421 (0.368-0.488) | 0.526 (0.454-0.611) | 0.690 (0.581-0.809) | 0.844 (0.692-0.996) | 1.02 (0.812-1.22) | 1.23 (0.942-1.49) | 1.57 (1.14-1.95) | 1.87 (1.30-2.38) |
| 30-min | 0.325 (0.285-0.377) | 0.413 (0.363-0.478) | 0.567 (0.495-0.657) | 0.708 (0.611-0.823) | 0.929 (0.783-1.09) | 1.14 (0.931-1.34) | 1.38 (1.09-1.64) | 1.66 (1.27-2.01) | 2.11 (1.53-2.62) | 2.52 (1.75-3.20) |
| 60-min | 0.403 (0.353-0.466) | 0.511 (0.449-0.592) | 0.701 (0.613-0.813) | 0.876 (0.756-1.02) | 1.15 (0.969-1.35) | 1.41 (1.15-1.66) | 1.70 (1.35-2.03) | 2.05 (1.57-2.49) | 2.61 (1.90-3.25) | 3.12 (2.17-3.97) |
| 2-hr | 0.503 (0.456-0.571) | 0.630 (0.566-0.712) | 0.823 (0.735-0.932) | 1.00 (0.887-1.14) | 1.29 (1.12-1.48) | 1.56 (1.31-1.79) | 1.87 (1.53-2.18) | 2.24 (1.76-2.66) | 2.83 (2.11-3.46) | 3.37 (2.40-4.21) |
| 3-hr | 0.582 (0.531-0.649) | 0.720 (0.658-0.801) | 0.912 (0.827-1.01) | 1.09 (0.979-1.21) | 1.37 (1.21-1.53) | 1.61 (1.39-1.82) | 1.91 (1.60-2.19) | 2.26 (1.84-2.69) | 2.85 (2.21-3.49) | 3.38 (2.52-4.26) |
| 6-hr | 0.762 (0.706-0.829) | 0.936 (0.866-1.02) | 1.14 (1.05-1.25) | 1.32 (1.22-1.45) | 1.59 (1.44-1.75) | 1.82 (1.61-2.01) | 2.07 (1.81-2.32) | 2.38 (2.03-2.71) | 2.95 (2.44-3.53) | 3.44 (2.77-4.30) |
| 12-hr | 0.967 (0.893-1.05) | 1.18 (1.09-1.29) | 1.43 (1.32-1.56) | 1.64 (1.50-1.80) | 1.95 (1.76-2.14) | 2.20 (1.96-2.44) | 2.46 (2.16-2.76) | 2.76 (2.38-3.14) | 3.23 (2.71-3.76) | 3.62 (2.96-4.33) |
| 24-hr | 1.08 (1.01-1.16) | 1.33 (1.24-1.43) | 1.58 (1.48-1.70) | 1.79 (1.68-1.92) | 2.08 (1.94-2.23) | 2.30 (2.13-2.46) | 2.52 (2.33-2.79) | 2.78 (2.53-3.17) | 3.26 (2.78-3.79) | 3.65 (2.99-4.37) |
| 2-day | 1.28 (1.20-1.37) | 1.57 (1.47-1.68) | 1.87 (1.75-2.00) | 2.12 (1.98-2.26) | 2.45 (2.29-2.62) | 2.71 (2.52-2.89) | 2.97 (2.75-3.17) | 3.23 (2.97-3.46) | 3.57 (3.26-3.86) | 3.83 (3.48-4.42) |
| 3-day | 1.40 (1.30-1.50) | 1.71 (1.59-1.84) | 2.04 (1.90-2.20) | 2.32 (2.16-2.49) | 2.70 (2.51-2.90) | 2.99 (2.77-3.22) | 3.29 (3.03-3.54) | 3.60 (3.29-3.88) | 4.00 (3.63-4.35) | 4.31 (3.89-4.63) |
| 4-day | 1.51 (1.40-1.64) | 1.85 (1.72-2.01) | 2.22 (2.06-2.39) | 2.52 (2.34-2.72) | 2.95 (2.72-3.18) | 3.28 (3.02-3.54) | 3.62 (3.32-3.92) | 3.96 (3.61-4.30) | 4.43 (4.00-4.83) | 4.80 (4.30-5.25) |
| 7-day | 1.79 (1.65-1.94) | 2.19 (2.03-2.38) | 2.61 (2.42-2.83) | 2.96 (2.74-3.20) | 3.43 (3.17-3.71) | 3.80 (3.50-4.10) | 4.16 (3.82-4.50) | 4.53 (4.14-4.91) | 5.02 (4.54-5.46) | 5.38 (4.85-5.88) |
| 10-day | 2.01 (1.86-2.17) | 2.46 (2.28-2.66) | 2.92 (2.72-3.15) | 3.29 (3.06-3.54) | 3.78 (3.50-4.06) | 4.14 (3.82-4.45) | 4.49 (4.14-4.84) | 4.84 (4.45-5.22) | 5.28 (4.83-5.72) | 5.61 (5.10-6.09) |
| 20-day | 2.65 (2.45-2.85) | 3.25 (3.00-3.50) | 3.83 (3.55-4.13) | 4.29 (3.98-4.61) | 4.87 (4.50-5.23) | 5.28 (4.89-5.68) | 5.68 (5.25-6.11) | 6.06 (5.58-6.52) | 6.52 (5.99-7.03) | 6.84 (6.26-7.40) |
| 30-day | 3.19 (2.95-3.43) | 3.90 (3.62-4.20) | 4.59 (4.26-4.94) | 5.13 (4.76-5.51) | 5.82 (5.40-6.25) | 6.33 (5.85-6.80) | 6.81 (6.29-7.34) | 7.27 (6.70-7.85) | 7.85 (7.20-8.50) | 8.26 (7.55-8.97) |
| 45-day | 3.96 (3.69-4.26) | 4.84 (4.51-5.21) | 5.68 (5.30-6.10) | 6.33 (5.90-6.79) | 7.16 (6.67-7.67) | 7.75 (7.21-8.30) | 8.31 (7.72-8.91) | 8.84 (8.19-9.49) | 9.47 (8.76-10.2) | 9.91 (9.13-10.7) |
| 60-day | 4.69 (4.37-5.04) | 5.74 (5.34-6.17) | 6.72 (6.26-7.20) | 7.47 (6.97-8.01) | 8.42 (7.84-9.03) | 9.10 (8.46-9.75) | 9.73 (9.04-10.4) | 10.3 (9.57-11.1) | 11.0 (10.2-11.9) | 11.5 (10.6-12.4) |

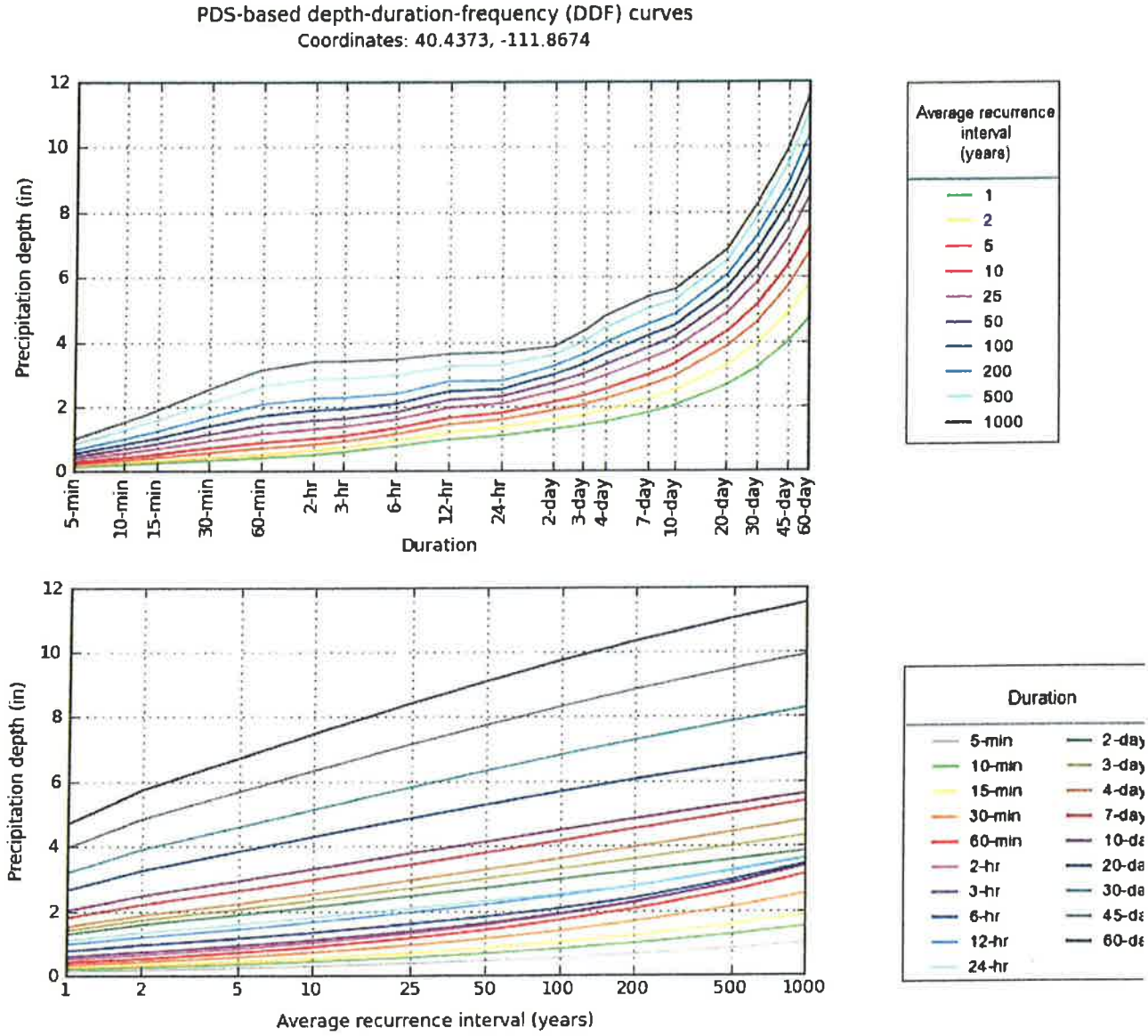
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Back to Top

## PF graphical

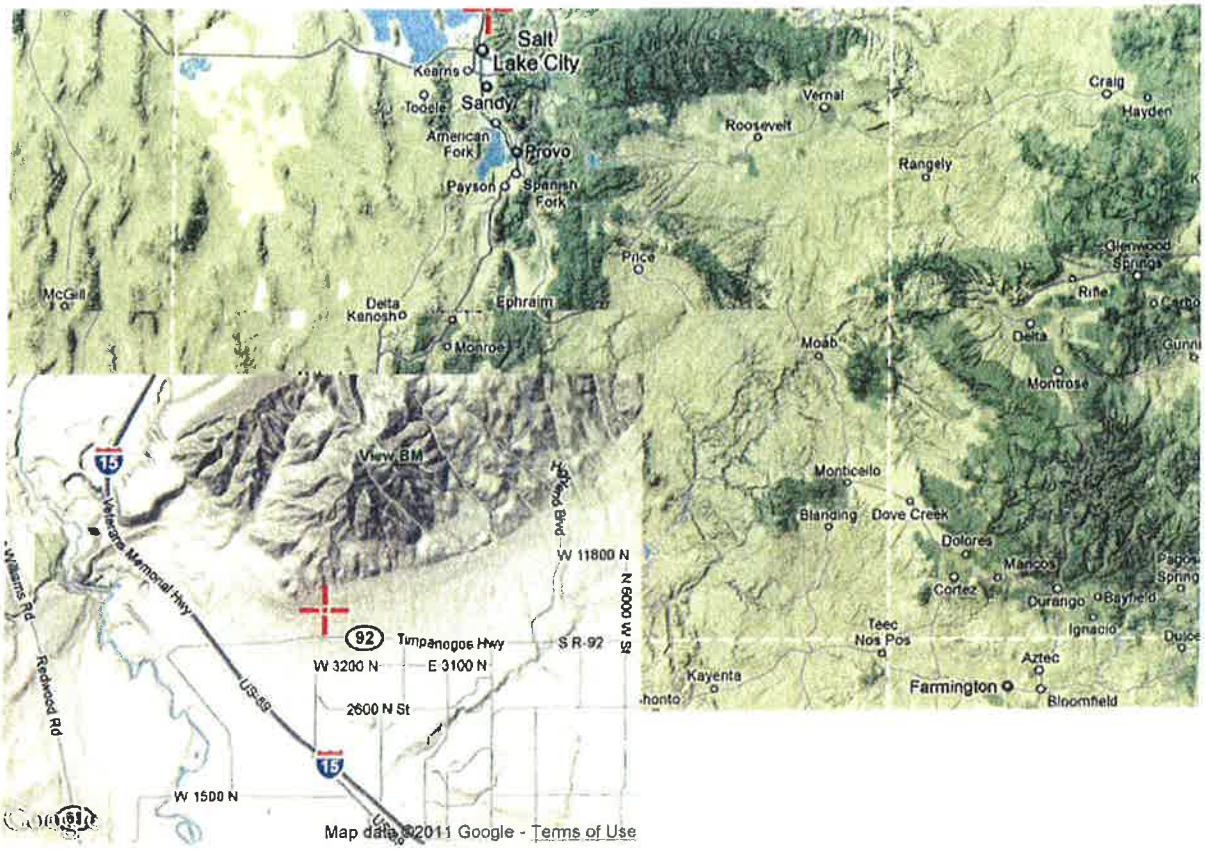



NOAA/NWS/OHD/HDSC Created (GMT): Fri Apr 22 19:49:49 2011

Back to Top

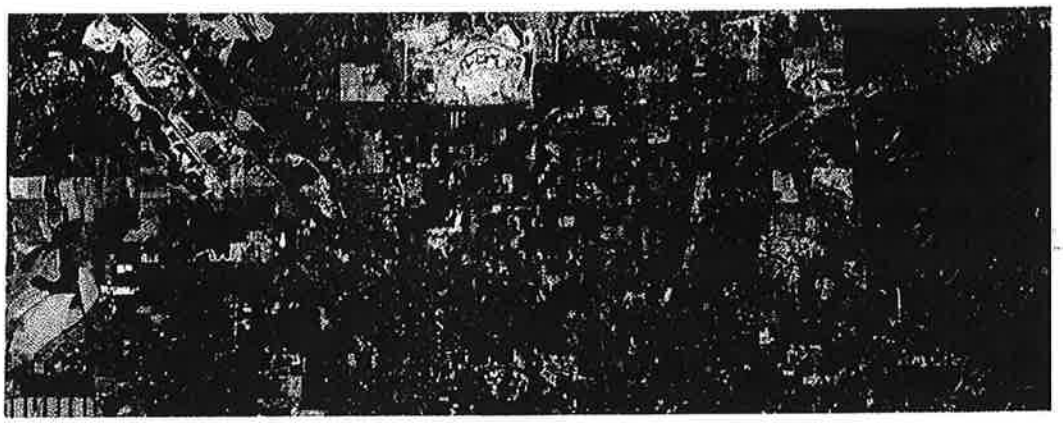
## Maps & aerials

Small scale terrain




**Large scale map**


**Large scale aerial**



Disclaimer

NOAA Atlas 14, Volume 1, Version 5
Location name: Lehi, Utah, US*
Coordinates: 40.4373, -111.8674
Elevation: 4978ft*
* source: Google Maps

**POINT PRECIPITATION FREQUENCY ESTIMATES**

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

## PF tabular

**PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]**

| Duration | Average recurrence interval(years) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 5 | 10 | 25 | 50 | 100 | 200 | 500 | 1000 |
| 5-min | 1.54 (1.34-1.78) | 1.94 (1.72-2.26) | 2.68 (2.34-3.11) | 3.35 (2.89-3.89) | 4.39 (3.70-5.15) | 5.36 (4.39-6.34) | 6.49 (5.16-7.76) | 7.82 (5.99-9.50) | 9.96 (7.22-12.4) | 11.9 (8.27-15.1) |
| 10-min | 1.17 (1.03-1.36) | 1.48 (1.30-1.72) | 2.03 (1.78-2.36) | 2.54 (2.20-2.96) | 3.34 (2.81-3.91) | 4.09 (3.35-4.82) | 4.94 (3.93-5.90) | 5.96 (4.56-7.23) | 7.58 (5.50-9.43) | 9.06 (6.29-11.5) |
| 15-min | 0.968 (0.848-1.12) | 1.22 (1.08-1.42) | 1.68 (1.47-1.95) | 2.10 (1.82-2.44) | 2.76 (2.32-3.24) | 3.38 (2.77-3.98) | 4.09 (3.25-4.88) | 4.92 (3.77-5.98) | 6.26 (4.55-7.79) | 7.49 (5.20-9.52) |
| 30-min | 0.650 (0.570-0.754) | 0.826 (0.726-0.956) | 1.13 (0.990-1.31) | 1.42 (1.22-1.65) | 1.86 (1.57-2.18) | 2.27 (1.86-2.68) | 2.75 (2.19-3.28) | 3.32 (2.54-4.03) | 4.22 (3.06-5.25) | 5.04 (3.50-6.41) |
| 60-min | 0.403 (0.353-0.466) | 0.511 (0.449-0.592) | 0.701 (0.613-0.813) | 0.876 (0.756-1.02) | 1.15 (0.969-1.35) | 1.41 (1.15-1.66) | 1.70 (1.35-2.03) | 2.05 (1.57-2.49) | 2.61 (1.90-3.25) | 3.12 (2.17-3.97) |
| 2-hr | 0.252 (0.228-0.286) | 0.315 (0.283-0.356) | 0.412 (0.368-0.466) | 0.501 (0.444-0.569) | 0.646 (0.558-0.738) | 0.779 (0.656-0.897) | 0.936 (0.762-1.09) | 1.12 (0.878-1.33) | 1.42 (1.05-1.73) | 1.69 (1.20-2.11) |
| 3-hr | 0.194 (0.177-0.216) | 0.240 (0.219-0.267) | 0.304 (0.275-0.338) | 0.362 (0.326-0.404) | 0.455 (0.401-0.510) | 0.536 (0.463-0.607) | 0.636 (0.534-0.730) | 0.753 (0.613-0.896) | 0.947 (0.736-1.16) | 1.13 (0.839-1.42) |
| 6-hr | 0.127 (0.118-0.138) | 0.156 (0.145-0.171) | 0.191 (0.176-0.208) | 0.221 (0.203-0.241) | 0.266 (0.240-0.292) | 0.303 (0.270-0.335) | 0.346 (0.302-0.388) | 0.398 (0.340-0.452) | 0.492 (0.407-0.589) | 0.575 (0.463-0.718) |
| 12-hr | 0.080 (0.074-0.087) | 0.098 (0.091-0.107) | 0.119 (0.109-0.130) | 0.136 (0.125-0.149) | 0.162 (0.146-0.178) | 0.182 (0.163-0.202) | 0.204 (0.179-0.229) | 0.229 (0.197-0.260) | 0.268 (0.225-0.312) | 0.300 (0.246-0.359) |
| 24-hr | 0.045 (0.042-0.048) | 0.055 (0.052-0.059) | 0.066 (0.062-0.071) | 0.075 (0.070-0.080) | 0.087 (0.081-0.093) | 0.096 (0.089-0.103) | 0.105 (0.097-0.116) | 0.116 (0.105-0.132) | 0.136 (0.116-0.158) | 0.152 (0.124-0.182) |
| 2-day | 0.027 (0.025-0.029) | 0.033 (0.031-0.035) | 0.039 (0.036-0.042) | 0.044 (0.041-0.047) | 0.051 (0.048-0.055) | 0.056 (0.052-0.060) | 0.062 (0.057-0.066) | 0.067 (0.062-0.072) | 0.074 (0.068-0.080) | 0.080 (0.072-0.092) |
| 3-day | 0.019 (0.018-0.021) | 0.024 (0.022-0.026) | 0.028 (0.026-0.031) | 0.032 (0.030-0.035) | 0.037 (0.035-0.040) | 0.042 (0.038-0.045) | 0.046 (0.042-0.049) | 0.050 (0.046-0.054) | 0.056 (0.050-0.060) | 0.060 (0.054-0.067) |
| 4-day | 0.016 (0.015-0.017) | 0.019 (0.018-0.021) | 0.023 (0.021-0.025) | 0.026 (0.024-0.028) | 0.031 (0.028-0.033) | 0.034 (0.031-0.037) | 0.038 (0.035-0.041) | 0.041 (0.038-0.045) | 0.046 (0.042-0.050) | 0.050 (0.045-0.055) |
| 7-day | 0.011 (0.010-0.012) | 0.013 (0.012-0.014) | 0.016 (0.014-0.017) | 0.018 (0.016-0.019) | 0.020 (0.019-0.022) | 0.023 (0.021-0.024) | 0.025 (0.023-0.027) | 0.027 (0.025-0.029) | 0.030 (0.027-0.032) | 0.032 (0.029-0.035) |
| 10-day | 0.008 (0.008-0.009) | 0.010 (0.010-0.011) | 0.012 (0.011-0.013) | 0.014 (0.013-0.015) | 0.016 (0.015-0.017) | 0.017 (0.016-0.019) | 0.019 (0.017-0.020) | 0.020 (0.019-0.022) | 0.022 (0.020-0.024) | 0.023 (0.021-0.025) |
| 20-day | 0.006 (0.005-0.006) | 0.007 (0.006-0.007) | 0.008 (0.007-0.009) | 0.009 (0.008-0.010) | 0.010 (0.009-0.011) | 0.011 (0.010-0.012) | 0.012 (0.011-0.013) | 0.013 (0.012-0.014) | 0.014 (0.012-0.015) | 0.014 (0.013-0.015) |
| 30-day | 0.004 (0.004-0.005) | 0.005 (0.005-0.006) | 0.006 (0.006-0.007) | 0.007 (0.007-0.008) | 0.008 (0.007-0.009) | 0.009 (0.008-0.009) | 0.009 (0.009-0.010) | 0.010 (0.009-0.011) | 0.011 (0.010-0.012) | 0.011 (0.010-0.012) |
| 45-day | 0.004 (0.003-0.004) | 0.004 (0.004-0.005) | 0.005 (0.005-0.006) | 0.006 (0.005-0.006) | 0.007 (0.006-0.007) | 0.007 (0.007-0.008) | 0.008 (0.007-0.008) | 0.008 (0.008-0.009) | 0.009 (0.008-0.009) | 0.009 (0.008-0.010) |
| 60-day | 0.003 (0.003-0.003) | 0.004 (0.004-0.004) | 0.005 (0.004-0.005) | 0.005 (0.005-0.006) | 0.006 (0.005-0.006) | 0.006 (0.006-0.007) | 0.007 (0.006-0.007) | 0.007 (0.007-0.008) | 0.008 (0.007-0.008) | 0.008 (0.007-0.009) |

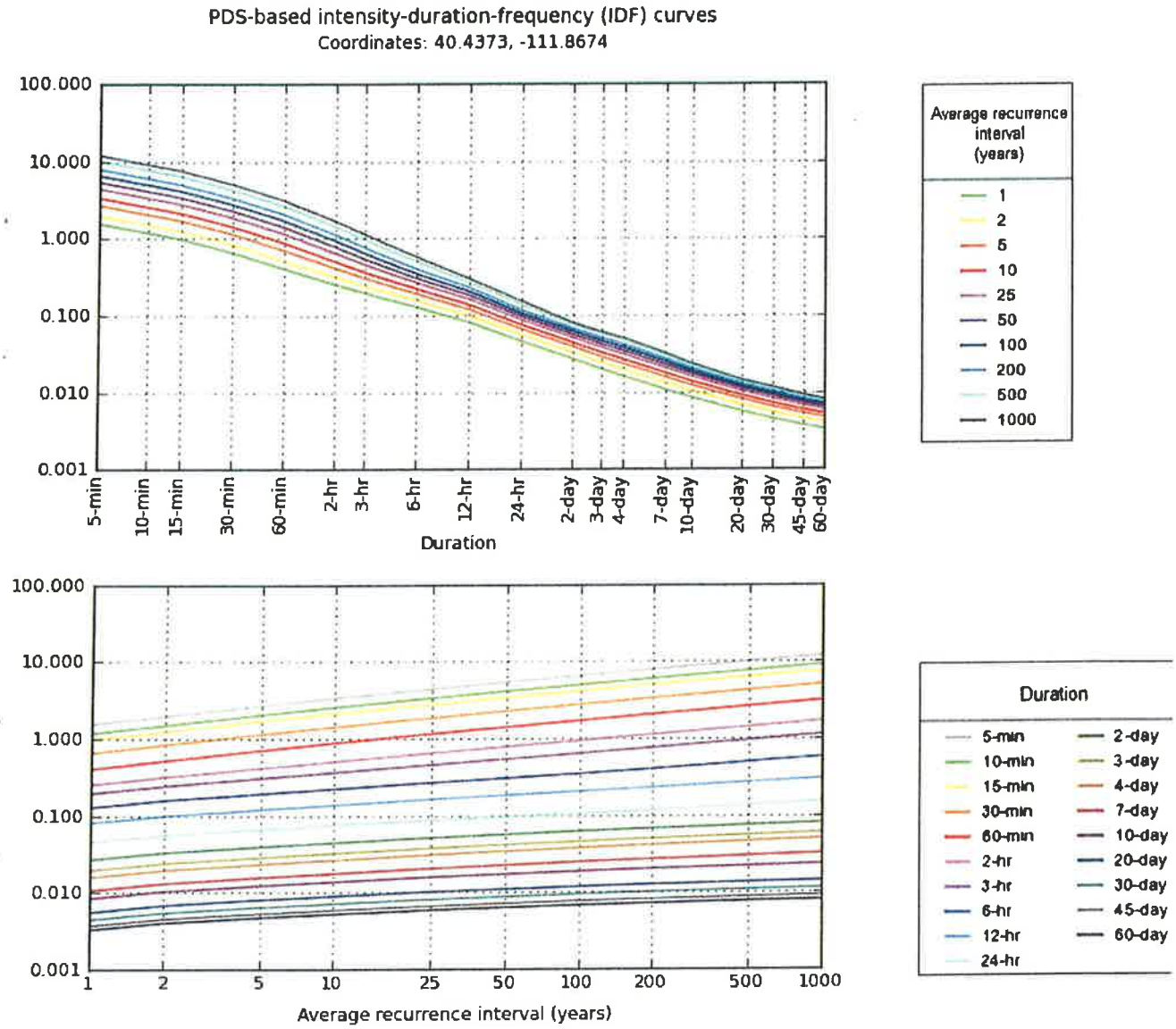
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Back to Top

## PF graphical




NOAA/NWS/OHD/HDSC

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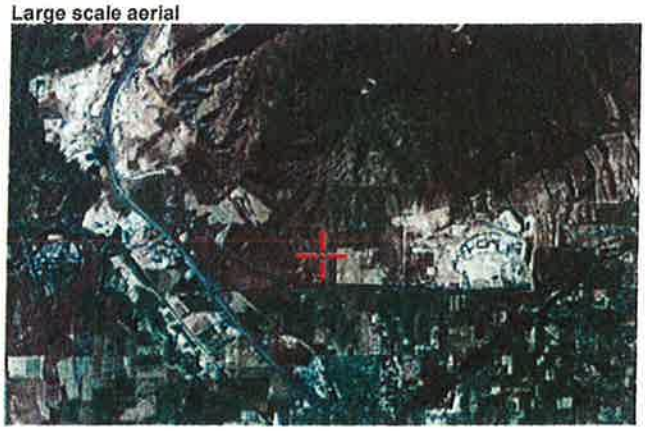
Back to Top

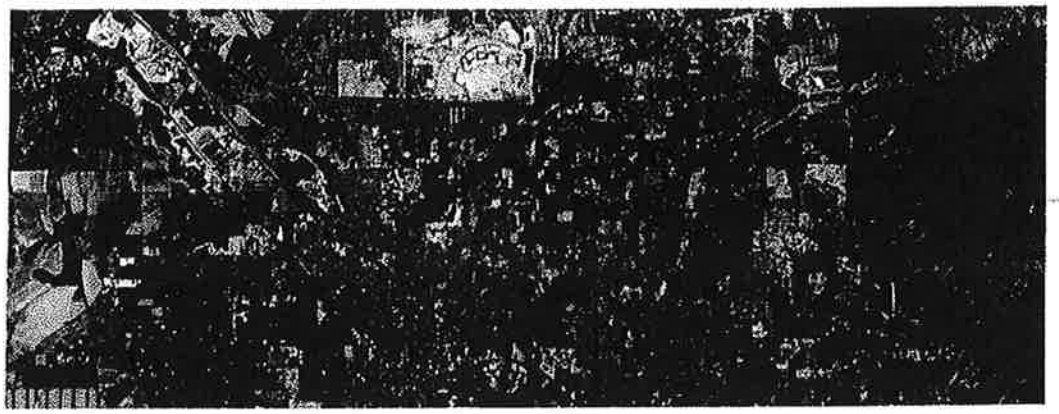
## Maps & aerials

**Small scale terrain**

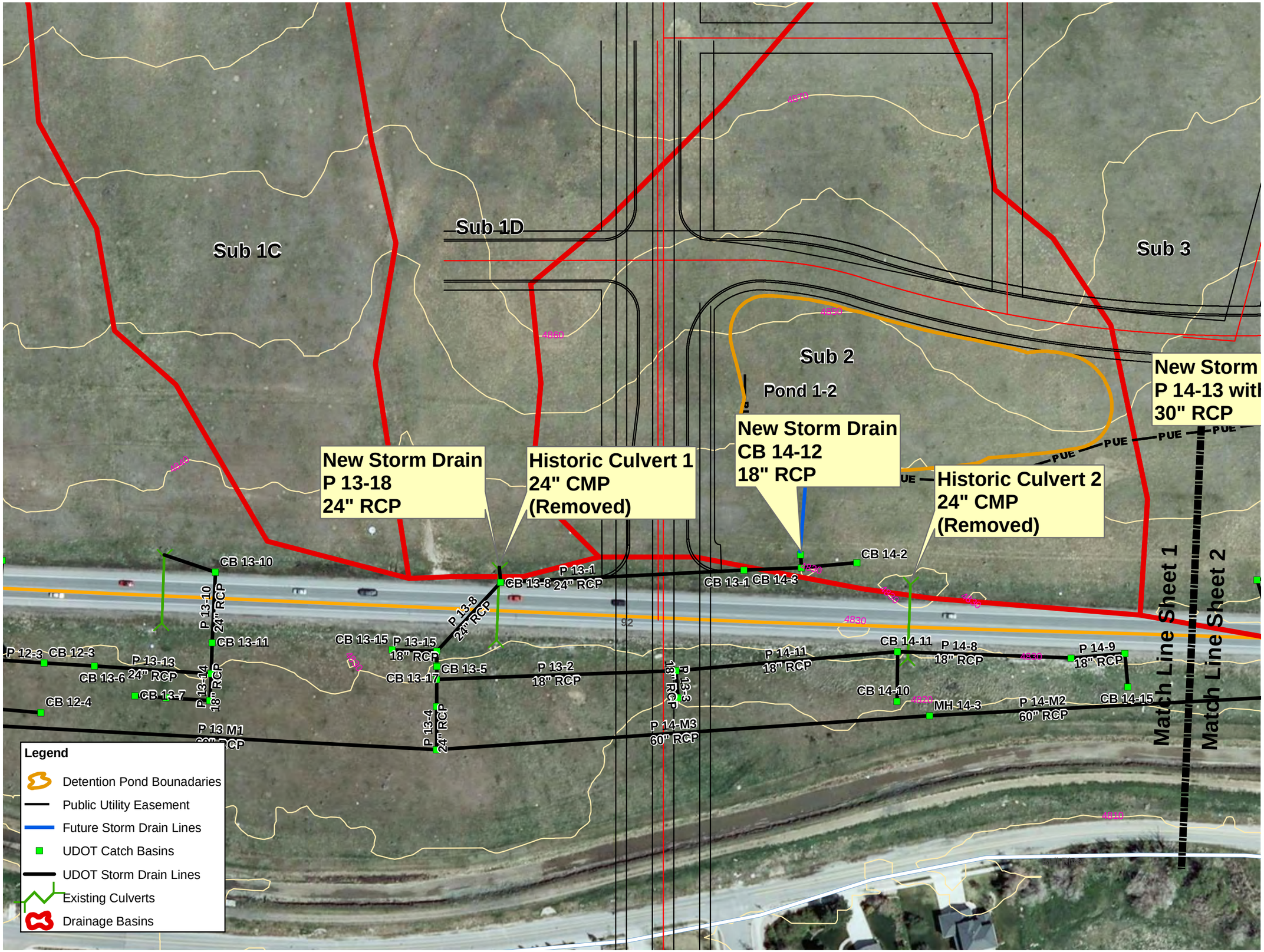

**Large scale map**


**Large scale aerial**





# Appendix B: Stantec Exhibits




**Stantec Consulting Inc.**
3995 S 700 E, Ste. 300
Salt Lake City, Utah
84107-2540
Tel. 801.261.0090
Fax. 801.266.1671
www.stantec.com



N

Graphic Scale

0 100
( in feet )

1 inch = 100 feet

Notes

Aerial Imagery -
Utah AGRC
High Resolution Orthophotography
(HRO) 2009, 1-ft

Client/Project

Micron
SR-92 Reconstruction
Existing and New Storm Drainage
Impact Evaluation

Lehi, Utah

Title

**Storm Drain Crossing Map 1**

| Project No. | Scale |
|---|---|
| 186200894 | 1 inch = 100 feet |

| Drawing No. | Sheet | Revision |
|---|---|---|
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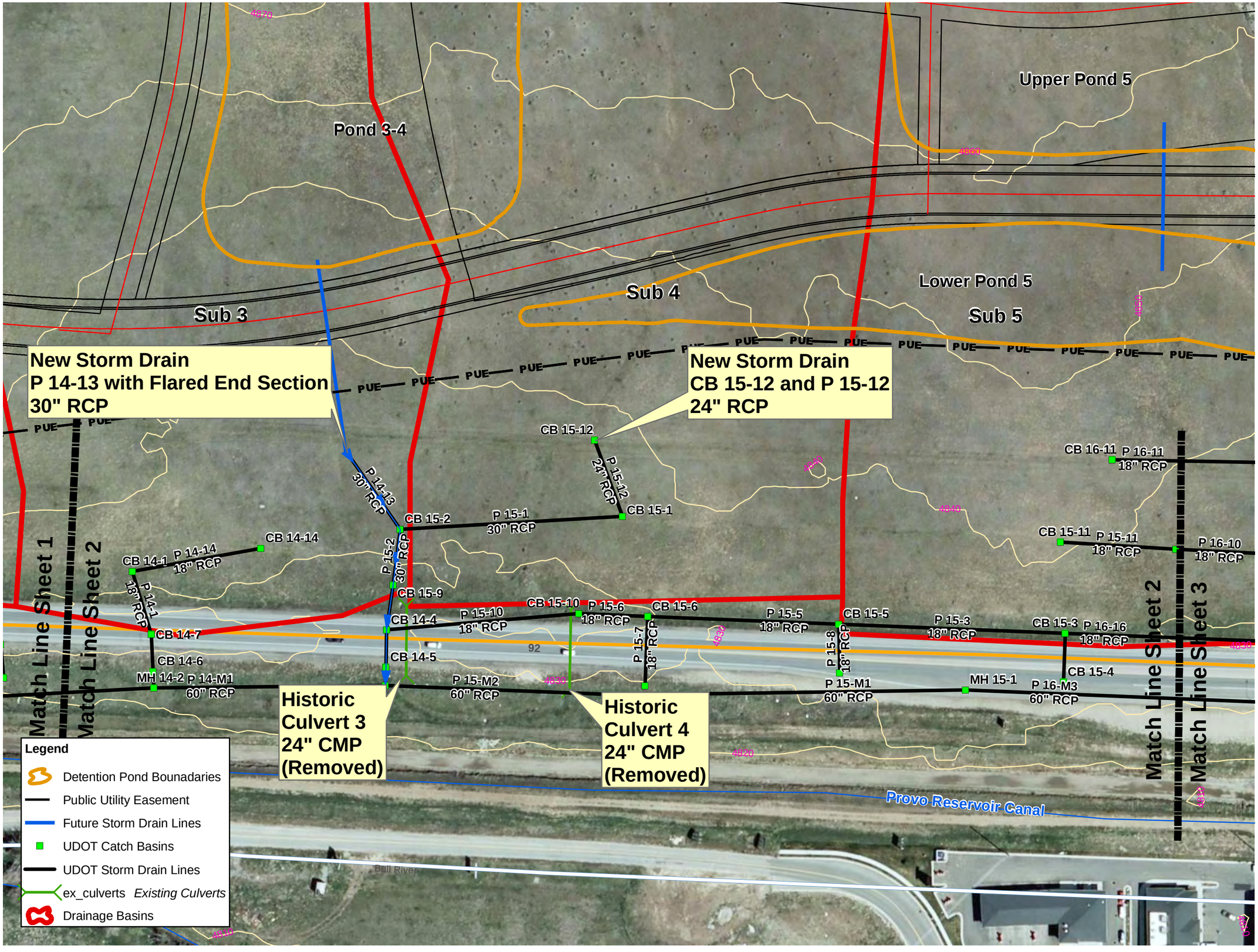


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Client/Project

Micron
SR-92 Reconstruction
Existing and New Storm Drainage
Impact Evaluation

Lehi, Utah

Title

**Storm Drain Crossing Map 2**

| Project No. | Scale |
|---|---|
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| Drawing No. | Sheet | Revision |
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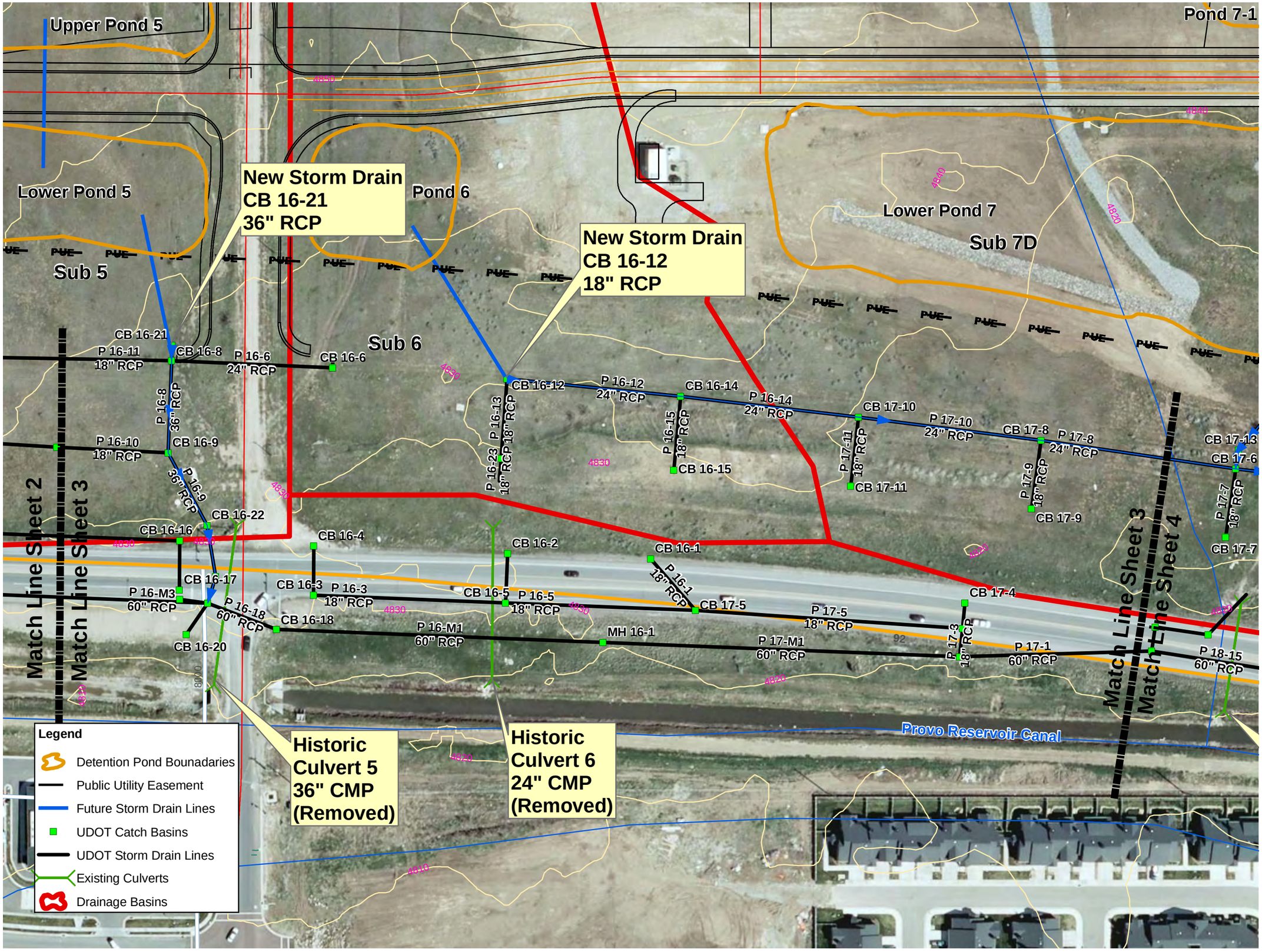


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Graphic Scale

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( in feet )

1 inch = 100 feet

Notes

Aerial Imagery -
Utah AGRC
High Resolution Orthophotography
(HRO) 2009, 1-ft

Client/Project

Micron
SR-92 Reconstruction
Existing and New Storm Drainage
Impact Evaluation

Lehi, Utah

Title

**Storm Drain Crossing Map 3**

| Project No. | Scale |
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| Drawing No. | Sheet | Revision |
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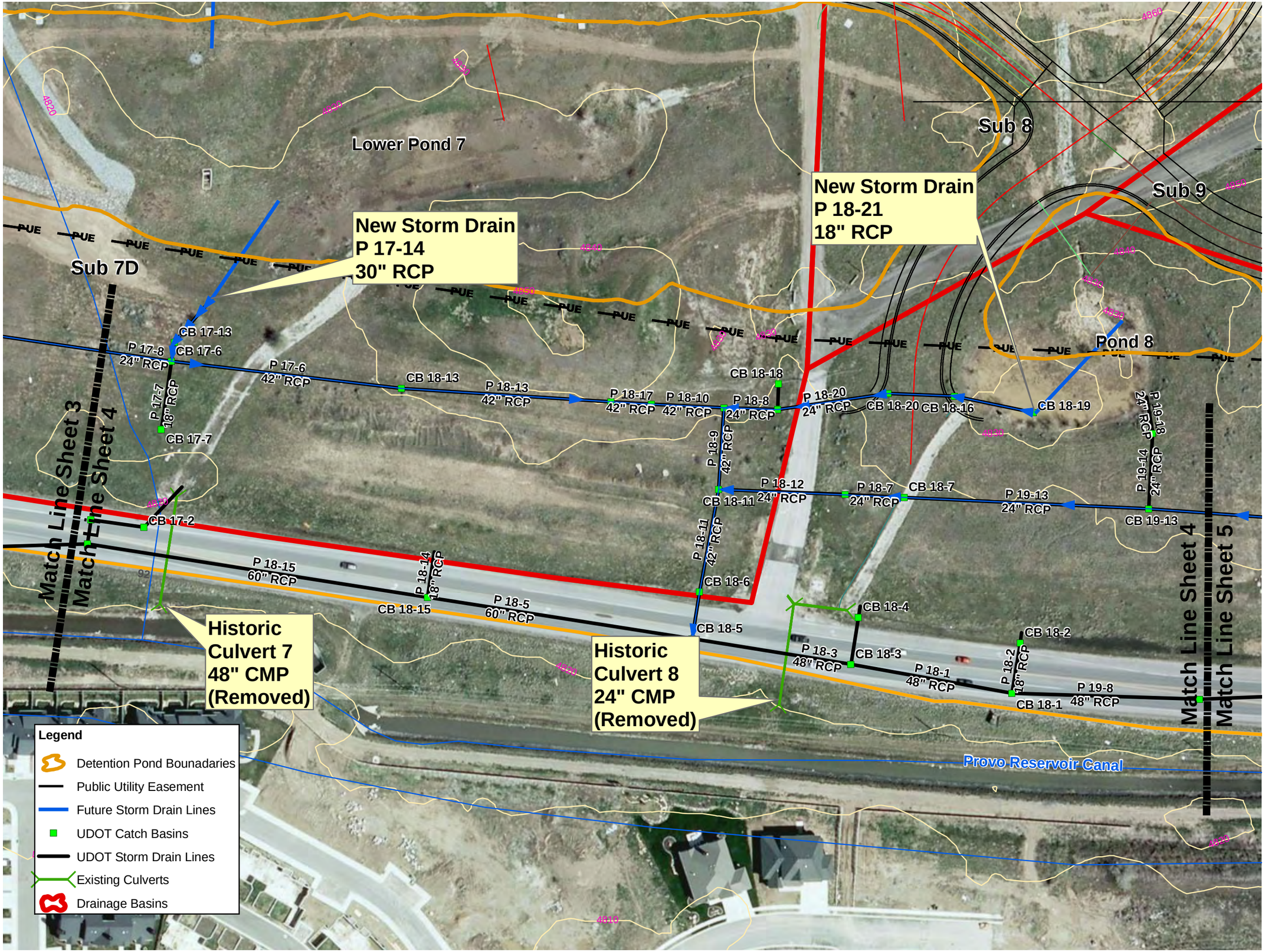


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Graphic Scale

0 100
( in feet )

1 inch = 100 feet

Notes

Aerial Imagery -
Utah AGRC
High Resolution Orthophotography
(HRO) 2009, 1-ft

Client/Project

Micron
SR-92 Reconstruction
Existing and New Storm Drainage
Impact Evaluation

Lehi, Utah

Title

**Storm Drain Crossing Map 4**

| Project No. | Scale |
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| Drawing No. | Sheet | Revision |
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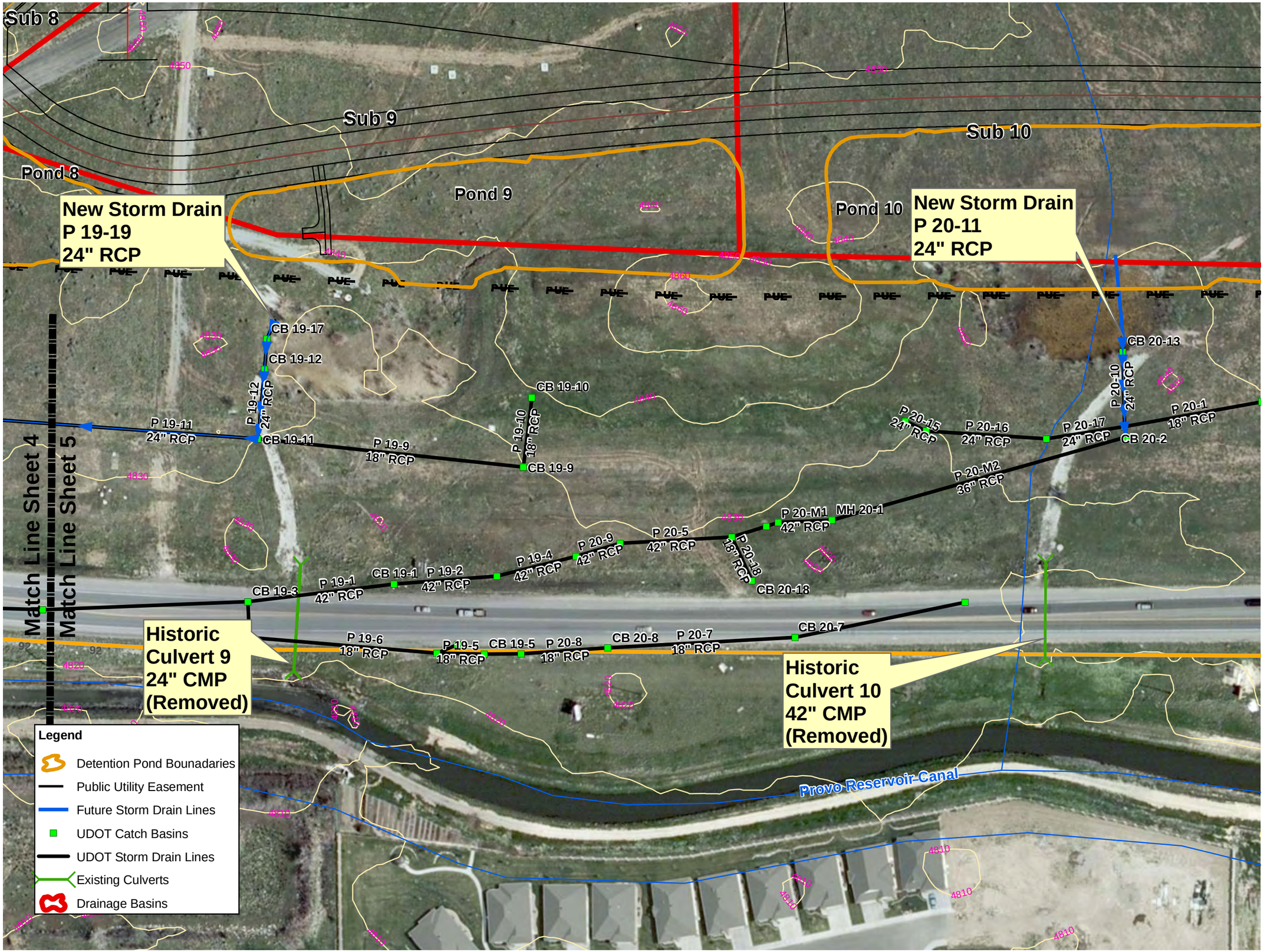


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Graphic Scale

0 100
( in feet )

1 inch = 100 feet

Notes

Aerial Imagery -
Utah AGRC
High Resolution Orthophotography
(HRO) 2009, 1-ft

Client/Project

Micron
SR-92 Reconstruction
Existing and New Storm Drainage
Impact Evaluation

Lehi, Utah

Title

**Storm Drain Map**

| Project No. | Scale |
|---|---|
| 186200894 | 1 inch = 100 feet |

| Drawing No. | Sheet | Revision |
|---|---|---|
| 0 | | 0 |