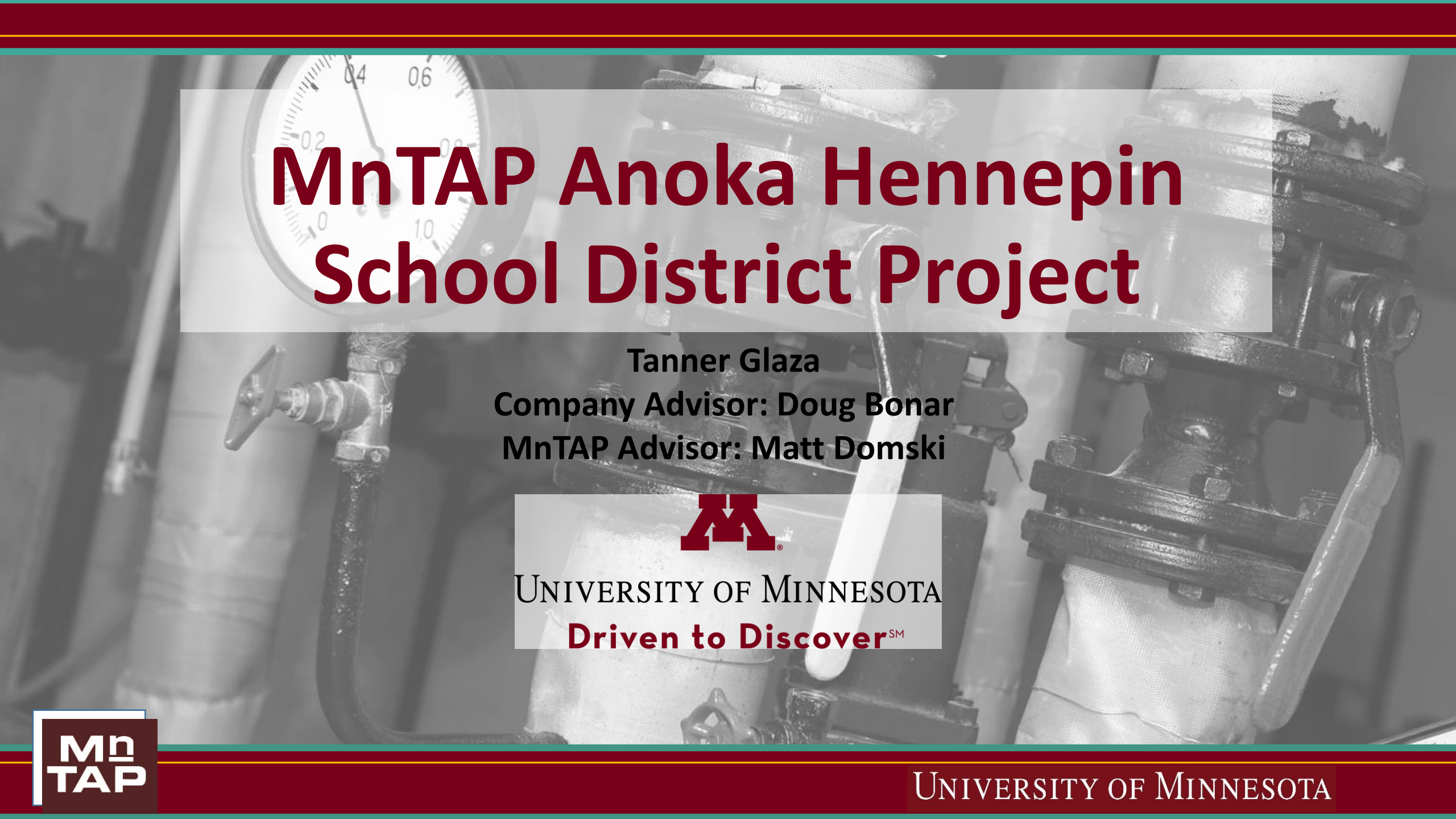


The background of the slide is a grayscale photograph of industrial equipment. On the left, a circular pressure gauge is visible with a scale from 0 to 1.0. To the right, there are various pipes, valves, and mechanical components, including a large valve handle. The overall scene suggests a technical or engineering environment.

MnTAP Anoka Hennepin School District Project

Tanner Glaza

Company Advisor: Doug Bonar

MnTAP Advisor: Matt Domski



UNIVERSITY OF MINNESOTA

Driven to DiscoverSM

District Background

- Started 1952 with 4,000 students
- 38,000 current Students
- One of the largest districts in the state
- 24 elementary schools, 6 middle schools (grades 6-8), 5 high schools



ANOKA-HENNEPIN
SCHOOLS
A future without limit



Motivations for change

- 23 irrigated school sites
- 2015: 107 million gallons
- 20% Reduction Goal



Project Overview

- Investigate areas where water use can be optimized
- Develop suggestions and solutions to improve water use and efficiency
- Establish a comprehensive and detailed database of all irrigation systems within the district



Approach

- Root Depths



Approach

- Saturated Hydraulic Conductivity



Recommendation 1.1 a

Water reduction option	Change Type	Water reduced (per year)	Implementation cost	Status
Irrigation reduction for non-essential field zones	Water output Reduction	1,318,000 gal water	NA	Recommended



Recommendation 1.1 b

Water reduction option	Change Type	Water reduced (per year)	Implementation cost	Cost savings (per year)	Payback period	Status
Irrigation elimination for non-essential field zones	Water output Reduction	2,636,000 gal water	NA	\$45.00	Immediate	Tentatively recommended



Recommendation 1.2

Water reduction option	Change Type	Water reduced (per year)	Implementation cost	Status
5% Irrigation reduction for sites receiving too much water – root depth analysis and conductivity	Water output Reduction	155,000 gal water	NA	Recommended

Percent Water Reduced	Annual Water Savings (gallons)
5%	155,000
10%	310,000
15%	465,000
20%	621,000
30%	931,000



Recommendation 1.3

Water reduction option	Change Type	Water reduced (per year)	Implementation cost	Status
Aerate Champlin Park High School Baseball field/ Install Soil Moisture Sensor	Reduction of Water Demand	745,000 gal water	\$1500+ \$376	Planned/Recommended



Process Efficiency Improvements

- Detailed Maps
- Recommendation Implementation



The screenshot displays the APT (Advanced Planning Technologies) website. At the top, the APT logo is shown with the tagline "Advanced Planning Technologies, Inc. Since 1991". Below the logo, there is a banner for "Emergency Preparedness" featuring a fire evacuation map. The map includes a legend with symbols for "Alpha - Entrance & Exit Doors", "Exit Doors Only", and "Fire Evacuation Route". The map itself shows a building layout with various rooms and corridors, with red lines indicating evacuation routes. To the left of the map is a photo of a firefighter. Below the banner, there is a navigation bar with links: ABOUT, CONTACT US, DEMOS, NETREQUEST, NETTASK, OUR CLIENTS, PRODUCT & SERVICES, ROI, TESTIMONIALS, and TRAINING & EVENTS. Below the navigation bar, there is a section titled "About" with the "Advance Planning Technologies Mission" statement. To the right of the "About" section is a "RESOURCE LINKS" section with links to ADA, Aerial Maps, and AIA.

APT
Advanced Planning Technologies, Inc. Since 1991

Emergency Preparedness

Architectural Number and Names
Fire Evacuation Route - Primary Entrance Designations
Alpha - Entrance & Exit Doors
Exit Doors Only
Fire Evacuation Route

ABOUT CONTACT US DEMOS NETREQUEST NETTASK OUR CLIENTS PRODUCT & SERVICES ROI TESTIMONIALS TRAINING & EVENTS

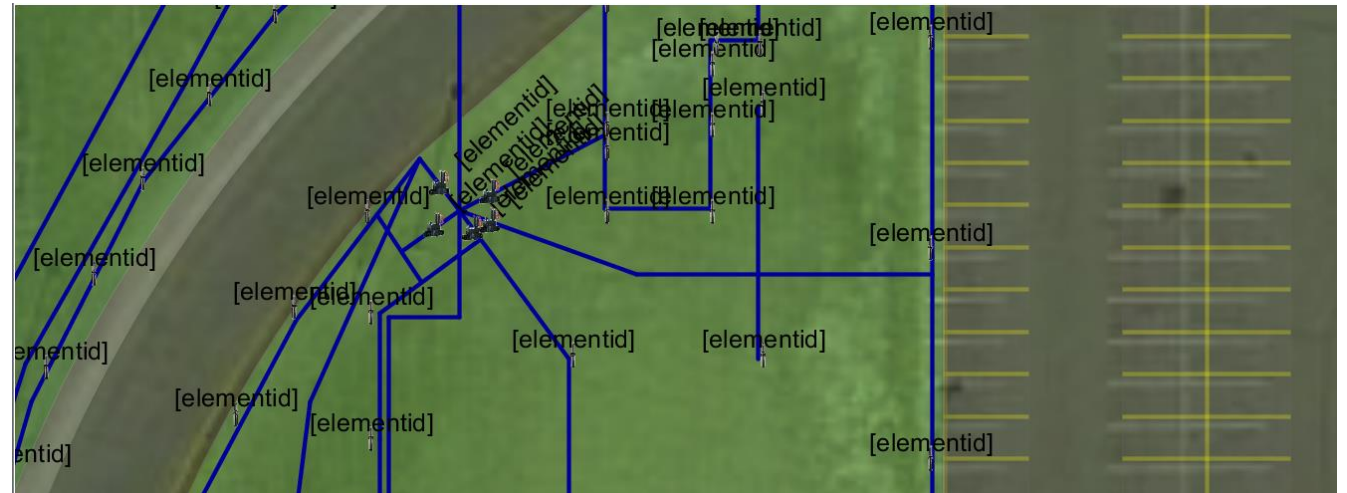
About
Advance Planning Technologies Mission
Our mission is to provide an affordable, intuitive and comprehensive internet based system that manages and communicates all the organizational and facility information to every occupant, service provider, manager and emergency personnel that the

RESOURCE LINKS
ADA - Americans with Disabilities Act
Aerial Maps
AIA - The American Institute of Architects
Buildings - Buildings

Example Site



X Andover HS Site Plan



Overall Project Table

Water reduction option	Change Type	Water reduced (per year)	Implementa tion cost	Cost savings (per year)	Payback period	Status
Irrigation reduction for non-essential field zones	Water output Reduction	1,318,000 gal water	NA	\$23.00	Immediate	Recommended
Irrigation elimination for non-essential field zones	Water output Reduction	2,636,000 gal water	NA	\$45.00	Immediate	Tentatively recommended
Irrigation reduction for sites receiving too much water – root depth analysis and conductivity	Water output Reduction	155,000 gal water	NA	\$3.00	Immediate	Recommended
Aerate Champlin Park High School Baseball field/ Install Soil Moisture Sensors	Reduction of Water Demand	745,000 gal water	\$1500+ \$376	\$13.00	146 years	Planned/Recommended
Total		3,536,000 gal water				
Process efficiency improvements	Change Type	Waste reduced (per year)	Implementa tion cost	Cost savings (per year)	Payback period	Status
Construct detailed maps of District irrigation infrastructure	Data collection and organization	NA	NA	NA	NA	Partially implemented

Future Projects

- Conduct grass length vs. water demand test
- Consider more non essential areas to optimize
- Investigate irrigation head efficiency
- Finish head and valve layers on Net Request



Personal Benefits

- Experience Applications
- Coworkers



Questions?

This project was sponsored in part by Metropolitan Council Environmental Services