10450 Holmes Road, Suite 600, Kansas City, MO 64131-3471
(816) 360-2700

HDR

City of Branson
Purchasing Office
Attn: David Rockhill, CPM
110 W. Maddux Street, Suite 200
Branson, MO 65616

Branson Wastewater Treatment Plant
Flood Protection, RFP 2495-09

Helping Branson

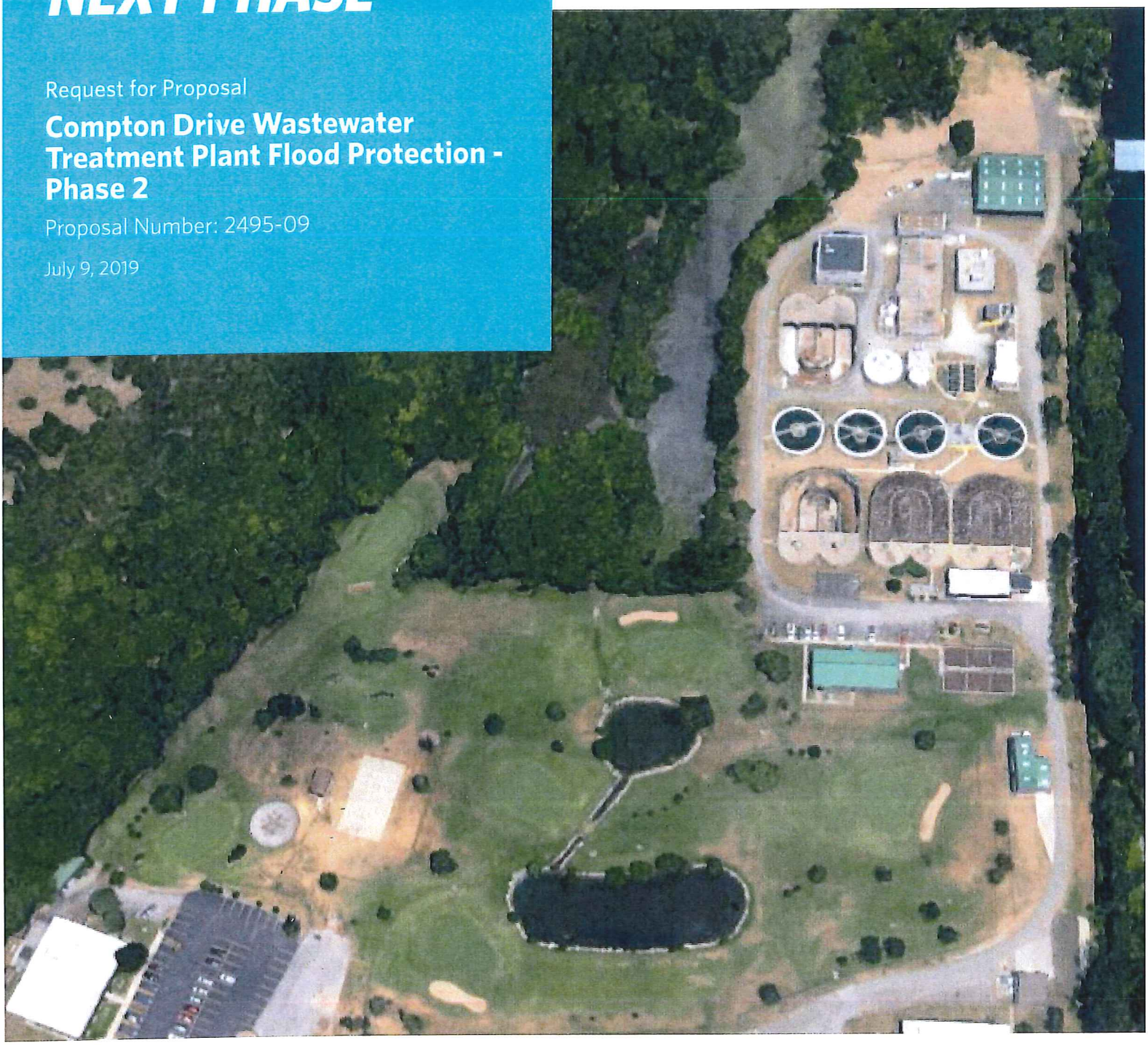
COMPLETE THE NEXT PHASE

Request for Proposal

Compton Drive Wastewater Treatment Plant Flood Protection - Phase 2

Proposal Number: 2495-09

July 9, 2019



City of Branson MISSOURI

HDR

July 9, 2019

City of Branson
Purchasing Office
Attn: David Rockhill, CPM
110 W. Maddux Street, Suite 200
Branson, MO 65616

RE: Branson Wastewater Treatment Plant Flood Protection, RFP 2495-09

The City of Branson has had quite a number of nervous days and nights over the past decade as the sirens sounding the release of flow from Table Rock Dam echo in the background and the thunderstorms rage. The U.S. Army Corps of Engineers completed Table Rock Dam in 1958-59 and since that time the City has witnessed changes; changes in the regulated 100-year water surface elevation, and frequency of experiencing high water levels. The Federal Emergency Management Agency 100-year water surface elevation has increased approximately 5-feet since the mid-90's and 3+ high water events equivalent to the 50-year flood in the past decade is statistically speaking more frequent that anticipated. Proactively responding to the forecasted 10-inch rain in December 2017 the City took a big step to providing some additional flood protection at the Compton Drive WWTP by purchasing and deploying the Aqua Dam system. In doing so, City Staff could make no guarantees as to whether that would be sufficient protection, nor could the Corps of Engineers guarantee the rainfall and in turn the release rates would not overtop that protection and inundate the WWTP.

For Branson, there is more than enough uncertainty with the risk of major flood damage to the WWTP and environmental impact on the pristine waters of Lake Taneycomo that you don't need more uncertainty when selecting a Teaming Partner. You deserve to have complete confidence in a firm that is unquestionably qualified to study and design the correct cost-effective solution, always with your goals guiding the process. HDR's commitment to the City of Branson starts with our Team — you know and trust Charlie from the many years of working together including in his role as Project Manager on the first Phase of this project. It's a natural fit for Charlie to continue to lead a team of experts all focused on quality and value for Branson. You also know and trust Eric who will be our Design Engineer Lead and like Charlie, will be fully committed to this project from start to finish.

We greatly appreciate the opportunity you've given us to be considered as your Partner in this challenging project and welcome your review of our proposal. If you have any questions, please call Charlie at (913) 314-0225.

Sincerely,

HDR Engineering, Inc.

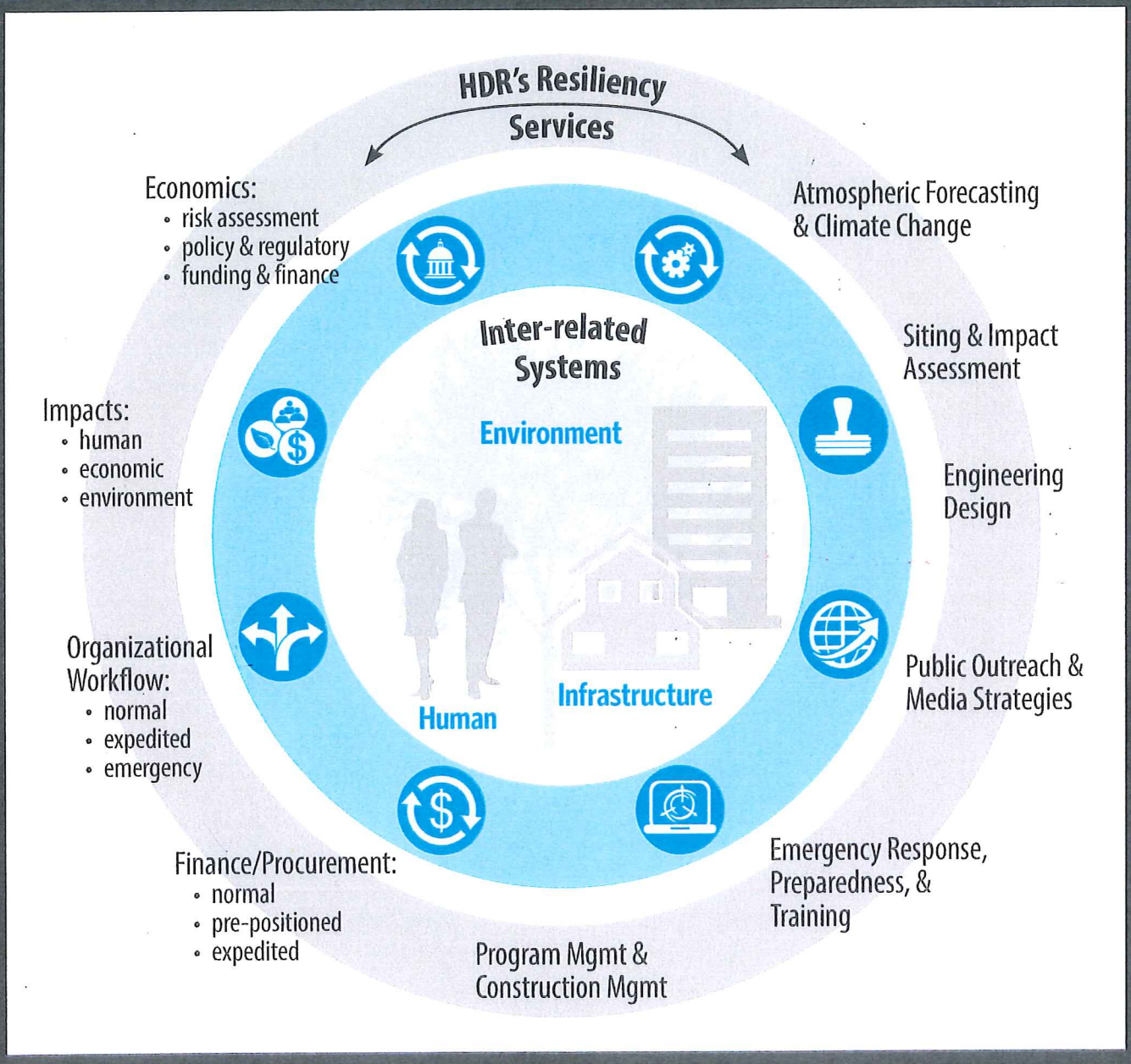
Charlie Sievert, PE
Project Manager

Eric Dove, PE, LEED AP
Lead Design Engineer

hdrinc.com

2139 E. Primrose, Suite E, Springfield, MO 65804
T 417.351.6500 **F** 417.865.4085

Project Understanding and Approach



Project Understanding and Approach

The City recognizes that experiencing three (3) 50-year flood events in the past decade is more than just another statistic worth noting. The high water events came within inches of overtopping the existing earthen berm that currently protects the Compton WWTP. There are significant risks to not only the City's wastewater treatment plant (WWTP), but also potentially significant environmental impact to Lake Taneycomo and the natural resources that distinguish the City. Over time, the City has taken steps to increase the level of protection the earthen berm provides at the Compton WWTP. From raising the berm and flood proofing key facilities, the City has also invested in temporary measures for a more immediate response to predicted high water events. For example, in advance of the forecasted flooding in late 2017, the City purchased and deployed Aqua Dam flood barriers to protect the WWTP.

There are very few practical temporary measures that are going to provide Branson the level of protection that is prudent when considering the potential cost of having to replace or rebuild the plant, not to mention the potential environmental impact to Lake Taneycomo. HDR understands the situation Branson is facing and we have helped numerous Clients make the tough decisions on what to protect, to what level it should be protected, and when to put the protection in place. We agree with the step-wise process Branson has chosen. The next critical steps in this step-wise process are to further evaluate the above-grade and below-grade conditions at the site. We also understand there are potential moving targets that the City has no control over and in some cases, no one has control over since it is Mother Nature. Increasing rainfall intensity, increased frequency of high water events, and changing times of the year of rainfall and storm patterns cannot be ignored. In certain ways, Branson does have the advantage of Table Rock Lake Dam; a US Army Corps of Engineers (USACE) facility which does have flood protection as one of its mission objectives. With changing weather patterns and/or changing operational considerations, USACE has over time modified not only the control structures on the dam itself but also how the facility is operated. These changes have resulted in Federal Emergency Management Agency (FEMA) redefinition of the 100-year flood level from time to time. Our approach is to clearly identify not only the decision points the City can control, but also those potential moving targets like changes in USACE operations of the dam, FEMA redefining and remapping of the 100-year flood, and factors of safety for variables that exist. HDR will work directly with Branson to characterize flood-related risks, develop cost-effective alternatives, and implement solutions that will maximize your investment towards long-term, community resiliency.

Regulatory Agencies

Any project that falls within the FEMA regulatory floodway or floodplain is going to trigger some level of regulatory involvement. In the case of the Compton WWTP, where the current regulatory mapping shows the delineated floodway coincides with the earthen berm paralleling Lake Taneycomo and the entire WWTP within the delineated floodplain, this proposed flood protection project will require engagement with FEMA, USACE, and Missouri Department of Natural Resources (MDNR) at a minimum. As was pointed out in the RFP, these three agencies were introduced to Branson's step-wise approach to protecting their WWTP in Phase 1, but the agencies neither jumped at

the opportunity to help fund the project, nor did they identify specific design criteria or level-of-protection required. Such a response at the very early stage of a project of this nature is typical, as there are not clear regulatory standards for level-of-protection for WWTP's from flood events, tornadoes, or other natural disasters.

Despite the seemingly silent response from these regulatory agencies, **this project presents opportunities to engage in specific discussions with regulators and stakeholders, alike, to collectively address, coordinate, and discuss resiliency issues, floodplain management, regulatory changes, and win-win strategies.** For the past 20 plus consecutive years, HDR has held direct contracts with multiple USACE districts, including work for the Little Rock District. Our understanding of USACE requirements, processes, and programs enables us to provide trusted guidance and deliver timely solutions. We have been successful in building partnerships and connecting local governments with USACE cost-sharing programs. **We have a proven process to successfully navigate through "red tape" within the various regulatory agencies.** We'll discuss this more in a following section of our proposal concerning Funding Opportunities.

In the early stages of the project, it is important to follow a design process that is endorsed by USACE, FEMA, MDNR, and any other participating agencies. This process will help to maintain eligibility for possible financial support, and will also validate the design approach when it comes time to approve any one of several permits that will be required. HDR has designed numerous levees, flood control projects and clearly establish agency buy-in regarding the interpretation and implementation of such standards on specific projects.

HDR's approach will be to engage with these agencies immediately after the Notice to Proceed. As we'll discuss more in the Hydraulic Modeling section, we understand that **FEMA is considering a hydraulic model update that could potentially change the previously defined 100-year regulatory limits.** We will facilitate clear communication and documentation of the City's goals for flood risk management; FEMA's expectations, ongoing studies, and future regulatory changes; and document the consensus path forward towards flood risk management at the Compton WWTP. We will request their current effective model and document clearly what everyone has agreed to.

Similarly, with USACE and MDNR, we will engage with them early and clearly delineate the City's goals with this project, and discuss what level of engagement they anticipate on this and subsequent stages of the project. With all of these agencies, we understand that they cannot predict what future regulatory changes will happen. The likelihood that any of the agencies will fund the improvements necessary to meet potential regulatory changes (i.e. flood protection from a 50 yr event to a 100-yr event). is very minimal. This is a risk, we understand this risk. We will do everything possible to manage this within the flexibility of the design, and documentation of each of the agencies concurrence with the design standards, level of protection, and factor of safety.

Hydraulic Modeling

HDR is very familiar with FEMA's White River model. Our staff has completed hydraulic modeling and mapping revisions under a contract with the City associated with Branson Landing. Also, through our relationships with the State Emergency Management Agency (SEMA), we know that Taney County is in discovery period this year, which means likely remapping and base flood elevation changes 15 to 18 months from now. In 24 to 30 months, preliminary maps should be available. In addition, the remapping will likely use a different hydraulic modeling option, 2D RAS, which will likely result in different base flood elevations. HDR has extensive experience with the new hydraulic modeling approach being proposed (2D RAS). **SEMA has allowed us to review the draft models before they are released to the public and we can help influence how the models are developed.**

Knowing this remapping activity is ongoing is no reason to stop this phase of the project. Reflecting back to the mid-90's when remapping changed the 100-yr water surface elevation by 4 to 5 ft and later again in the 2000's when it changed 0.5 to 1 ft, it is possible things could change whether it's the water surface elevation or possibly the floodway/floodplain delineation given new or different topographic.

HDRs approach is to stay closely engaged with SEMA as their remapping activities are taking place and provide the City with some "what-if" scenarios if things do change. These what-if scenarios will consider not only fixed flood wall or levee heights, but also preliminary designs that will allow for future modification like raising the flood wall elevation if changes occur.

Groundwater Modeling

Numerous site visits and discussions with Staff over the years gives us a clear picture of the steps you have taken to control groundwater as the lake levels rise. Much of the historic information is informal, that is, no long term piezometer readings, specific pumping rates, as-builts on the dewatering wells or well casings, it's still abundantly clear that in the absence of dewatering efforts, within a very short period of time, the water level inside the plant will equal that of the lake even though the current earthen berm has not been overtopped. There is a clear hydraulic connection in terms of observed action; what isn't clear yet, is where that connection is and how best of mitigate it.

Our approach to understanding the groundwater begins with the necessary field investigations that will provide the input needed for the 3D groundwater model. We do not recommend immediately jumping to extensive dewatering well installations and draw down pumping tests. Our approach is to work with our two specialized geotechnical firms and our internal geotechnical experts to establish a subsurface investigation plan that affords us the maximum flexibility of additional investigations without having to redo any of the preceding steps. For example, we will want to start recording groundwater depths relative to river stage immediately. We will be proposing some very traditional geotechnical boring and sampling techniques in our step-wise approach, but in doing so we will also have groundwater monitoring and potential draw down testing in mind as we select the appropriate drilling technique, drilling/casing size, and what is left in the ground both temporary and permanent. This will include consideration for installing one or more piezometers around the perimeter of the WWTP as well as making use of the existing dewatering wells. This will be discussed more in the following Geotechnical Investigation section.

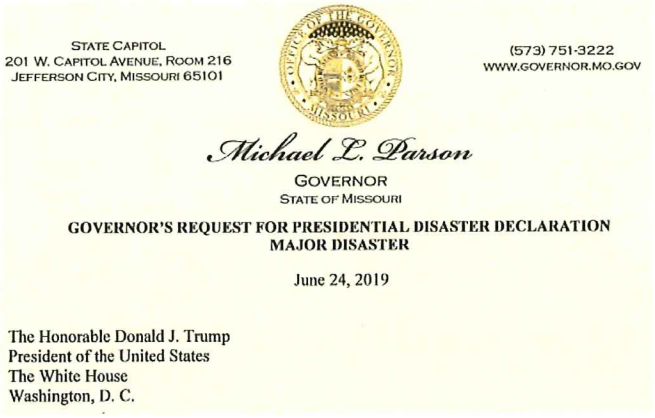
As we gather information in this step-wise process we will provide the City continual updates and give you the necessary information to make informed decisions on what additional field investigations are most cost effective. We will discuss this more in the Geotechnical Investigation section, as this is a critical stage. If for example, you're driving sheet pile and hit a massive floater mid-way to the planned bottom out depth, which impacts your piling installation and likely your groundwater control, this can result in costly change orders. Investment in this preliminary design stage is most often money well spent. **We never lose sight of the fact that you hold yourselves very accountable to your ratepayers and taxpayers for every dollar spent and we share that commitment with you. The continual communication along this step-wise process armed with the appropriate data to make informed decisions is where we all want to be.**

Funding Sources

HDR has worked with a variety of Federal funding sources such as Federal Emergency Management Agency (FEMA) Hazard Mitigation Grant Program (HMGP), FEMA Pre-Disaster Mitigation (PDM), FEMA Flood Mitigation Assistance (FMA), Community Development Block Grant Disaster Recovery (CDBG-DR), United States Army Corps of Engineers (USACE), Environmental Protection Agency and Clean Water Act State Revolving Funds (EPACWA-SRF), United States Department

of Agriculture Natural Resources Conservation Service (NRCS), just to name a few. The ring levee projects around the wastewater treatment plants in Des Moines and Cedar Rapids were both funded through FEMA HMGP grants which HDR helped prepare. The flooding in December 2015 prompted Presidential Disaster Declaration 4250 (PD-4250) and will provide an estimated $8 million in funding.

Branson is included in the communities that are eligible to receive funding. In addition, the prior flooding in June 2015 also received a presidential disaster declaration. Of the total funding, 7% is held aside for mitigation planning projects. On June 24, 2019, Governor Parson requested another presidential disaster declaration and as part of that he requested 20% set aside for the Hazard Mitigation grant assistance eligible statewide. We believe this preliminary design will be a perfect candidate for this funding.



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Michael L. Parson
GOVERNOR
STATE OF MISSOURI

GOVERNOR'S REQUEST FOR PRESIDENTIAL DISASTER DECLARATION
MAJOR DISASTER

June 24, 2019

The Honorable Donald J. Trump
President of the United States
The White House
Washington, D. C.

The federal funding sources have a lot of similar elements and generally reference similar guidance documents. Central to these programs is developing a benefit-to-cost ratio. The benefits are calculated as damages that would have occurred if the project was not implemented. The benefits include the averted direct impact to the treatment plant, but also can include averting potential fines from EPA and averting recreational and tourism impacts to Lake Taneycomo. Our economist, **Jeremy Cook**, has already prepared similar calculations in the Ozarks as part of the Springfield Integrated Plan. Jeremy has also assisted in the prior HMGP applications and is well versed with specific programs requirements such as FEMA's HAZUS and BCAR.

HDR has also assisted on a USACE Little Rock District funded project in Springfield that involved a 50% cost share between the local sponsor and the Federal Government. Our work included developing the hydraulic models, hydrology models, coordinating the project development and assisting with the economic model. HDR has an on-call type of contract with the USACE that can be accessed to work on this project under a cost share agreement with the Federal Government. We'd be happy to discuss this funding option with you.

Recent Local Federal Funding Experience

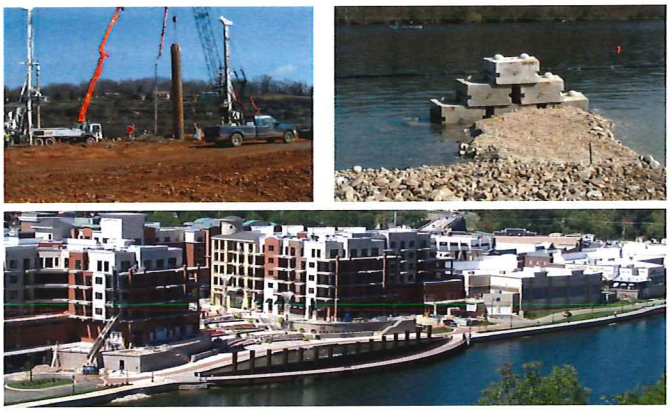
Project and Location	Funding Source/Program
Brush Creek Basin Feasibility Kansas City, MO	U.S. Army Corps of Engineers, Section 1135
Town Fork Creek Flood Risk Management Study, Kansas City, MO	U.S. Army Corps of Engineers, Section 22
Stormwater System Inventory Kansas City, KS	U.S. Army Corps of Engineers, Section 22
Stormwater Basin Retrofit Study Columbia, MO	U.S. Army Corps of Engineers, Section 22
Blue River Flood Control Channel Improvements, Kansas City, MO	U.S. Army Corps of Engineers, Individually Authorized Project
Benedictine Bottoms Mitigation Site Atchison, KS	U.S. Army Corps of Engineers, Missouri River Recovery Program
Jordan Creek Flood Risk Management Study, Springfield, MO	U.S. Army Corps of Engineers, Section 205
Flood Mitigation Improvements City of Blair, NE	FEMA Hazard Mitigation Grant Program
Flood Protection for Water Pollution Control Facility, Cedar Rapids, IA	FEMA Hazard Mitigation Grant Program
Flood Rehabilitation for Wastewater Treatment Plant, Plattsmouth, NE	FEMA Hazard Mitigation Grant Program
Osage Beach Park Dam Rehabilitation Osage Beach, MO	FEMA Disaster Recovery Grant
Omaha CSO – Saddle Creek Retention Treatment Basin Omaha, NE	EPA Water Infrastructure Finance Innovation Act (WIFIA) Loan
Northwest Water Treatment Plant, Wichita, KS	EPA Water Infrastructure Finance Innovation Act (WIFIA) Loan

HDR offers demonstrated experience in leveraging outside funding for flood risk management and water resources management projects within the region. Outside funding sources have included the U.S. Army Corps of Engineers Continuing Authorities Programs, FEMA Flood Hazard Mitigation, FEMA Flood Mitigation Assistance, and other cost-sharing and grant-based sources.

Geotechnical Investigations

HDR is excited about having two great teaming partners, both of which have worked extensively in southern Missouri and know the area very well. **GeoEngineers**, and **Palmerton & Parrish, Inc.**, provide a full range of geotechnical and geophysical services and together will support our Team in going from the initial Geologic Evaluation to Subsurface Investigation Plan development, to the Geotechnical Baseline Report (GBR) ready to become a Contract Document the City will have complete confidence in.

Our proposed approach is to initially complete a Geologic Evaluation which comprises a thorough gathering and review of all available historic geotechnical and geophysical records.



Top Left — Drilled Pier Construction; Branson Landing; Branson, MO;
Top Right - Sea Wall Construction at the Landing; Branson, MO;
Bottom — Branson Landing; Branson, MO

The experience our Team has in Branson puts us ahead of other less experienced teams and this will benefit the City greatly in both cost and time savings. Through our many visits and extensive discussions with City Staff we have garnered a great appreciation of the long-standing knowledge of high-water events each staff member has. Through modifications to the existing levee system, dewatering activities, and monitoring of response time between rising lake levels and groundwater levels within the WWTP footprint, along with our collective knowledge of the area, we are confident that we can develop a step-wise Subsurface Investigation Plan that will be a balanced approach. Specifically, in a Workshop setting with you, our Team will walk through all available historic information including from our own projects in the general area, in order to develop a Plan. The Plan will include a range of flood protection schemes from various wall types to potential expansion of the existing earthen levee on the east side where there is more footprint to work with, site accessibility for a traditional drill rig for geotechnical investigation as well as deployment of both marine and dry land geophysical testing equipment. The initial phase of investigations will likely be traditional geotechnical borings which will likely require a combination of traditional auger drilling techniques, mud rotary, and also rock coring. The initial boring spacing will be at a wider spacing and complimented with geophysical techniques that will reduce the number of borings.

The Quality Control and Value Engineering is inherent in HDR's approach, as well that in our two teaming partners, but more so in that there is peer review of each other's work through each team member having their internal independent reviewers also reviewing the other teaming partners work.

With results from the Phase 1 investigations we will again Workshop with you to discuss our level of confidence in moving directly to a Geotechnical Baseline Report (GBR) which will become a Contract Document and relied upon for Bidding, or supplement the Phase 1 data with additional geotechnical and/or geophysical investigations. The geophysical investigation tools are, in most cases, much easier to deploy in both marine and dry land settings and in very simplified terms is a series of wires, electrodes, and interpretation of shock waves that produce a 1D, 2D, or 3D image of the subsurface to depths of up to 150 feet in certain material types. Particularly on the lake side, where the likely placement of some type of sheetpile floodwall system will have to be placed, there is questionable material below the waterline that will act to support the wall system at the toe to counter the tipping moment. There are several geophysical testing techniques that greatly compliment and go beyond what

traditional geotechnical tools can tell us about the subsurface materials,and these tools will allow us to find anomalies and focus our borings in those areas.

This Preliminary Design phase is a very critical phase and will be highly dependent on the integrity of the subsurface investigations that the final flood protection system will be designed upon to include not only the wall type or levee type, but also the seepage/groundwater control system. Through our phased approach, which start and end with very open and collaborative workshops, we will work with the City to ensure we have complete confidence that we have struck the right balance of subsurface investigations to avoid the possibility change orders once the project bids and goes to construction.

Preliminary Design and Cost Opinion

You, as the Owner, must have the greatest confidence in the Preliminary Design Report and Cost Opinion. **Your confidence in the quality and value of our deliverables will be not just through our words, but also our actions.** From the project initiation Kick-Off Meeting, to strategic workshops at each milestone, you will see thorough documentation of all meetings and engagements with the Regulatory Agencies, all third parties, and most importantly between the City and HDR. This Report is the record of a process that we as a Team will have gone through leaving no stone unturned as we identify the most cost effective flood protection plan to take forward through Final Design and Construction.

Quality Control and Value Engineering

We have partnered before on several successful projects and they were successful because of good communication and thorough quality control process that included a value engineering review. HDR has been proving quality and value driven solutions for our Clients for over 100-years. Our proof comes from the fact that the majority of our work comes from repeat engagements with long term Clients. Rather than including pages of charts and graphs showing you all the steps of our well established quality control and value engineering processes we would rather focus on how we are actually going to apply those to your project.

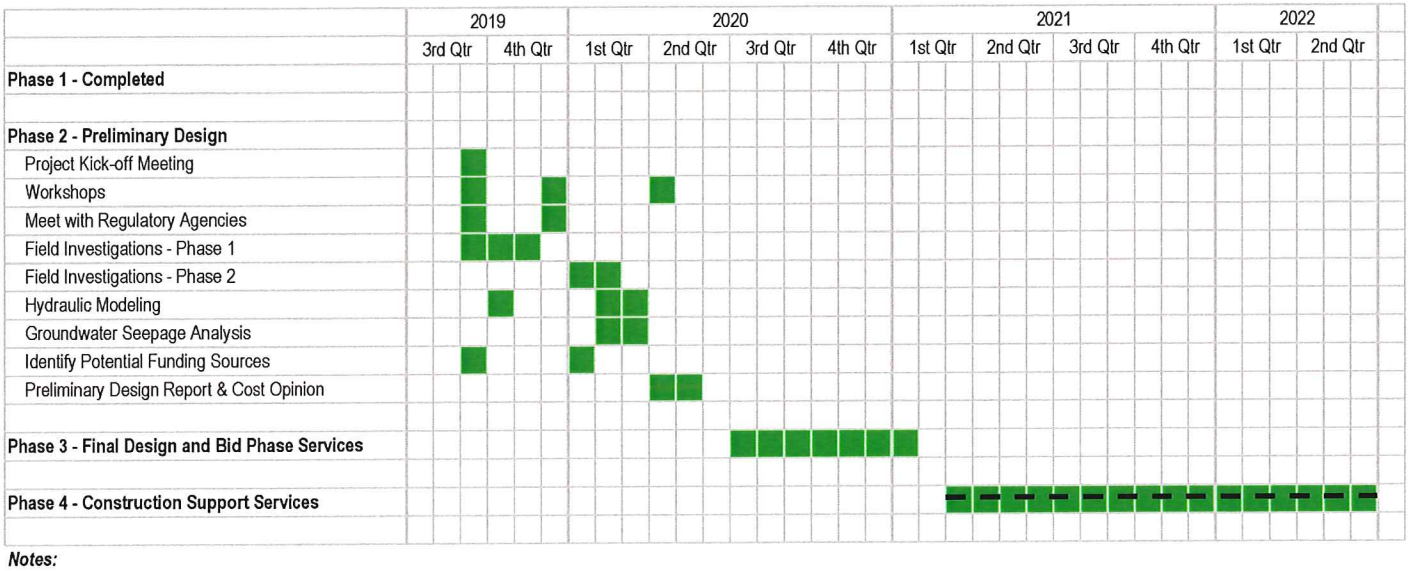
The process starts with our Team. We take very serious the selection of team members that will lead and execute each project. We are confident that in **Charlie Sievert** as Project Manager and **Eric Dove** as Design Engineer Lead, you have two of our most experienced and qualified engineers leading this critical project. As our Organizational Chart shows, Charlie and Eric will be supported by our most experienced staff in each key area and two exceptional teaming partners **GeoEngineers**, and **Palmerton & Parrish**. As discussed throughout our proposal, we want to move in a step-wise process with each building on the preceding and no step complete before a thorough quality control review with concurrence from you, the Owner. Value Engineering is inherent in everything we do as an experienced team, that "been there, done that" is real world experience that keeps us current on cutting edge geotechnical exploratory tools, construction materials and methods, critical thinking and questioning, and ultimately, complete confidence in our final recommendations. **Our Quality Control and Value Engineering will not be done behind closed doors, but rather on full display with the Owner and Staff representatives fully engaged.** We are confident that the step-wise process we walk through making critical decisions on what level of protection to design for, and how much additional freeboard to provide for will demonstrate to you the value of zeroing in on a fixed level and doing so confidently after thorough analysis and discussion with the Regulatory Agencies, and insurance providers. The step-wise process for geotechnical investigations and groundwater seepage analysis will also include a clear record of the value of each level of investigation during

this Preliminary Design phase as opposed to dealing with it during Construction Phase as a change order. There are a wide variety of options for characterizing the subsurface conditions from a single traditional boring that you extrapolate to represent the entire footprint of the project, to the other extreme where you bore holes so close together they could nearly act as the trench for building your floodwall. **Our quality control and value engineering process will provide you with the critical information you will need to make informed decisions and have full confidence in those decisions when faced with so many variables.** As an option, some Clients like to engage an independent 3rd Party to conduct a Quality Review and/or Value Engineering effort and we certainly support that approach if that is your preference. HDR acts as an independent 3rd Party reviewer when requested, and many of our Team members have participated in similar efforts.

In addition to the value, the cost of the data gathering that is the foundation of this Preliminary Design, will be the cost consideration of each alternative evaluated. HDR is actively engaged in flood protection projects both in response to all the flooding going on this year, to proactive studies and designs - we know real world costs of construction. We also understand regional pricing influences like risks, level of competition, contract terms, and history of bidding similar work in the region. Costs are estimated by the individual technical leaders of each element of the project and then combined and reviewed by the leadership team for completeness, elimination of any redundancy, while factoring in constructability, construction sequencing, and potential impacts from weather, or other aspects more challenging to definitively quantify. All of this is reviewed by an internal independent expert and all of this is done transparently with full engagement with the Owner.

We are confident that with the final deliverable of a sealed and signed Preliminary Design Report and Cost Opinion that City Staff will say they were engaged throughout the entire process and are in complete agreement. Based on this collaborative process, we believe the Staff will also be able to demonstrate that confidence to the Mayor, Board of Alderman, City Manager, and the citizens of Branson who ultimately will have to make some big decisions. We welcome the opportunity to stand with you to present the final Report to the Public and City Leadership.

Schedule



Notes:

- Phase 3 bid time could be adjusted based on the bidding environment which would be gauges by talking with likely Bidders and availability of funding.

- Phase 4 construction duration could be adjusted based on input from likely Bidders and City's desire to balance construction duration versus cost.

Construction Support Services by Consultant assumed to be intermittent with City taking lead.

Related Technical Experience

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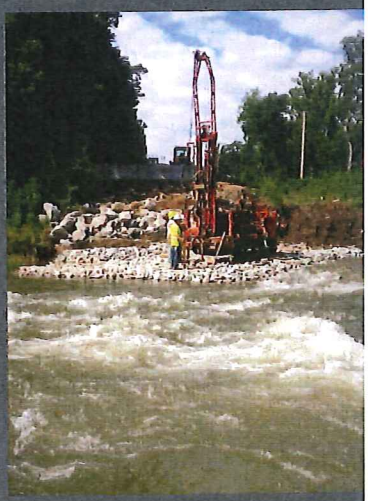
Michael L. Parson

GOVERNOR
STATE OF MISSOURI

GOVERNOR'S REQUEST FOR PRESIDENTIAL DISASTER DECLARATION
MAJOR DISASTER

June 24, 2019

The Honorable Donald J. Trump
President of the United States
The White House
Washington, D. C.



Related Technical Experience

Project	Interior Drainage/Levee or Floodwall Penetrations	H&H Analysis	Civil and Structural Design	USACE Permits/Approvals (Section 408/404)	Surveying	Geotechnical Evaluation	Underseepage Analysis	Utility Coordination	FEMA Criteria/Evaluation for Certification
City of Council Bluffs Council Bluffs Flood Control System/River Road Outfall, Council Bluffs, IA	●	●	●	●	●	●	●	●	●
Council Bluffs Interstate System Reconstruction & Levee Relocation, IDOT	●	●	●	●	●	●	●	●	
City of Omaha Missouri River Levee System Projects, Omaha, NE	●	●	●	●	●	●	●	●	●
City of Omaha Combined Sewer Overflow Projects, Omaha, NE	●	●	●	●	●	●	●	●	
City of Cedar Rapids Flood Protection Projects, Cedar Rapids, IA	●	●	●	●	●	●	●		
Des Moines WRA Wet Weather Treatment Facility (CSSSF), Des Moines, Iowa	●	●	●	●	●			●	
City of Blair Flood Recovery Projects, Blair, Nebraska	●	●	●	●	●			●	
Floodwall Rehabilitation & Levee Certification, Pembina, ND	●	●	●	●	●	●	●	●	●
Kaunakakai Flood Control Project, Molokai, HI	●	●	●	●	●	●			●
Levee Certification, Oroville, CA	●	●	●	●	●	●	●		●
Natomas Levee Improvement Program, Sacramento River Levee Reaches, CA	●	●	●	●	●	●	●	●	●
West Sacramento Area Flood Control Agency, Levee Improvements, CA	●	●	●	●	●	●	●	●	
Feather River West Levee Project, Sutter and Butte Counties, CA	●	●	●	●	●	●	●	●	●

Comments from Government Agencies and Municipalities

Limiting Changes: "The A-E **met all of the cost control requirements and exceeded them** when new comments came in on the revised 100% Contract 2 submittal that were outside of the SSOW of just revising the maintenance road designs. The A-E completed these revisions **without a modification in contract cost or schedule**." – *April Fontaine, Chief Geotechnical Engineering Branch, USACE Sacramento District*

"The A-E did a **very good job performing all of the work** in the SOW, and stayed on schedule and within budget. The Corps issued several POP extensions for the Natomas Reach I P&S work in the SOW, and the A-E was still **able to provide all of the products within the schedule required by the Corps, and without requiring additional funds**." – *Mark Boedtker, Acting Chief Civil Design Section, USACE Sacramento District*

Delivering a Product that Satisfies the Requirements: "HDR's design team worked to not only **identify cost saving opportunities to modify design standards/criteria** to fit the needs of our water resources projects, but was also able to work with the U.S. Army Corps of Engineers and the California Department of Water Resources to ultimately gain their approval for the changes. **HDR's innovation and relationships in this area have saved SAFCA tens of millions of dollars in our project construction costs.**" – *John Bassett, Director of Engineering, SAFCA*

"The HDR Design Team did an **outstanding job defining the severity and extent of levee deficiencies**, and **designing cost-effective remedial measures** for SBFCA's Feather River West Levee Project. The design team developed designs that either minimized the project footprint or mitigated the consequences of the necessary footprint. This **greatly reduced potential costs, landowner damages and environmental impacts**. A key to HDR's success was an Internal Design Review Team that worked closely with SBFCA to provide the most cost effective, efficacious solutions for a number of difficult design and cost issues. **HDR collaborated extensively with USACE, the CA DWR, and the Central Valley Flood Protection Board to obtain concurrence and approval of these measures**." – *Michael Inamine, Executive Director Sutter Butte Flood Control Agency*

1 Floodwall Design for Manhattan Veterans Administration Hospital

Veterans Administration (VA) Medical Center

New York, NY

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Project Manager
VA/CFM
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202.527.2945

STAFF INVOLVED
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- Pat Poepsel
- Wes Jacobs
- John Engel
- Jeremy Cook
- Vince Fallon
- Matt Wigle

ENGINEERS ESTIMATE
$30M

FINAL CONSTRUCTION COST
$26.2M

COMPLETION DATE
2017

SCHEDULE
Completed on Schedule

VALUE ENGINEERING
VE services were completed as part of normal HDR procedure

CONTRACT PERFORMANCE ASSESSMENT REPORTING SYSTEM (CPARS)
Very Good for Quality, Management and Regulatory Compliance

The Veterans Administration (VA) Medical Center was damaged by coastal flooding caused by Superstorm Sandy. HDR designed a new perimeter reinforced concrete flood wall with a foundation seepage cutoff and closure structures to protect the hospital from future storms. HDR's work included geotechnical,civil, structural, mechanical and electrical design, architectural design, permitting, and construction services.

HDR prepared civil site layout, including extensive utility relocations and modifications, developed Design Document Reports, plans and specifications and provided engineering support during construction. HDR utilized BIM and 3D drawings to identify and resolve potential conflicts with existing utilities, underground structural elements and other features in this highly urbanized setting. Backflow prevention valves and storm sewer/sanitary pump stations were incorporated into the design.

Design also included floodwall splash pad to provide additional protection in the event of wall overtopping, an underground vault to attenuate storm water flows, and a curved decorative face at the upper edge of the portion of the wall to reduce overtopping at extreme flood elevations. Because of the complex project configuration, HDR created a 3D model of the entire site to optimize floodwall design and maximize the amount of space available within the interior of the parcel after construction of the wall.

Design of the floodwall included security elements in compliance with Federal facility security provisions, and incorporation of brick veneer and column reliefs to make the wall compatible with the existing hospital and adjacent historic structures. Buoyancy-activated flood gates were incorporated at the perimeter access points along with wedge barriers, bollards, cameras, vehicles gates, and pedestrian gates. This project is an example of HDR's ability to provide a full-service multi-discipline team to solve complex civil design problems.

"HDR's expertise and diligence have been invaluable on this contract where the VA's resources have been strained. They have stepped up and provided timely guidance and advice whenever needed. Their flood wall expertise has proven invaluable"

Steve Davis, Contracting Officer, VA- CFM

2 Water Reclamation Facility Flood Protection Study and Flood Improvements

Des Moines Water Reclamation Authority

Des Moines, IA

REFERENCE
Scott Hutchens, PE
WRA Director
3000 Vandalia Road
Des Moines, IA 50317
515.323.8031

ENGINEERS ESTIMATE
$111.1M

FINAL CONSTRUCTION COST
Currently on track

COMPLETION DATE
Feb 2020 (est)

SCHEDULE
Currently on track

VALUE ENGINEERING
VE services were completed as part of normal HDR procedure

QUALITY CONTROL
All QC procedures were followed per client & HDR agreed upon terms.

In anticipation of applying for a Hazard Mitigation Grant offered through the State of Iowa, the WRA hired HDR to complete a Flood Protection Study to identify, quantify and evaluate the risk of inundation from a variety of sources. Alternatives were developed for mitigating these risks, and a recommended flood damage reduction plan was developed based on a benefit cost analysis. Particular attention was paid to protecting facilities critical to maintain plant operation in the case of an inundation event. The study focused on internal flooding, critical plant infrastructure and riverine flooding at the WRF. Project elements included:

- Analyzed potential inundation impacts for 28 buildings and structures.
- Evaluation of the levees surrounding the WRF in terms of freeboard.
- Floodwall around plant core
- Flood resiliency.

Staff Involved: Vicki Twerdochlib, Mike Butterfield, Patrick Poepsel, John Engel, Andy McCoy

3 Emergency Flood Services at the Papillion Creek Water Resource Recovery Facility (PCWRRF)

City of Omaha

Omaha, NE

REFERENCE
Jim Theiler
City of Omaha
1819 Farnam St, Ste 600
Omaha, NE 68183
402.444.4923

ENGINEERS ESTIMATE
$35M

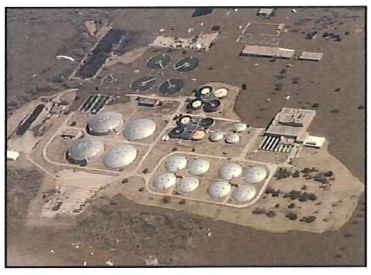
FINAL CONSTRUCTION COST
Currently on track

COMPLETION DATE
March 2019 - Ongoing

SCHEDULE
Currently meeting fast-track schedule requirements

VALUE ENGINEERING
VE services were completed as part of normal HDR procedure

QUALITY CONTROL
All QC procedures were followed per client & HDR agreed upon terms.



The Papillion Creek Water Resource Recovery Facility (PCWRRF) is a critical wastewater treatment facility that services the Omaha metropolitan area with an average daily flow of 60 MGD. On March 15, 2019, levees adjacent to the PCWRRF over topped and portions of the facility were completely submerged in over 8 feet of floodwater, rendering critical infrastructure unusable and causing untreated wastewater to be directly discharged to the Missouri River.

HDR immediately began working with the City to develop a plan and schedule for recovery implementation. A "SWAT" team comprised of electrical, process, architectural, structural, and mechanical engineers were on site the day the flood waters receded and immediately began assessing the damaged facilities. **Within a two-week time-frame, we developed over 80 task orders for emergency repairs or replacement of existing equipment, as well as tasks required to restore full facility operations.**

Staff Involved: Vicki Twerdochlib, Mike Butterfield, Patrick Poepsel, Trent Stober, John Engel, Andy McCoy, Ron Sova, Vince Fallon, Lance Worth, Kevin Thernes, Matt Wigle, Chris Malinowski, Keith Froscheiser, Derek Gardels

4 Flood Control and Mitigation Projects

City of Cedar Rapids

Cedar Rapids, IA

REFERENCE
Andrew Lundy
Process & Facilities Engineering Manager
Cedar Rapids Utilities Department
1111 Shaver Road NE
Cedar Rapids, IA 52403
319.286.5968

ENGINEERS ESTIMATE
$71M

FINAL CONSTRUCTION COST
$71M

COMPLETION DATE
2015

SCHEDULE
Completed successfully within time-frame

VALUE ENGINEERING
VE services were completed as part of normal HDR procedure

QUALITY CONTROL
All QC procedures were followed per client & HDR agreed upon terms.

On the heels of devastating damage estimated at over $70 million from record flooding in June 2008, the City of Cedar Rapids turned to HDR for post flood forensic analysis and development of a plan and design to protect the Cedar Rapids Water Pollution Control Facility (CRWPCF) from future flooding.

HDR assisted the City of Cedar Rapids to design a system of flood barriers to protect the City against a flood similar to the Floods of June 2008. The system is comprised of a combination of levees, floodwalls, gates, and pump stations.

The project included 25 gates to close streets and railroads that pass through the lines of protection. There are numerous storm water pump stations to evacuate storm water from the protected side of the flood protection when closed gates prevent gravity flow toward the river.

Staff Involved: Mike Butterfield, Patrick Poepsel, Trent Stober, John Engel, Vince Fallon, Lance Worth, Kevin Thernes, Matt Wigle, Keith Froscheiser, Derek Gardels

5 Tomahawk Creek Wastewater Treatment Facility

Johnson County Wastewater

Overland Park, KS

REFERENCE
Susan Pekarek
Chief Engineer
Johnson County Wastewater
11811 S. Sunset Dr, Ste 2500
Olathe, KS 66061
913.715.8543

ENGINEERS ESTIMATE
$280M

FINAL CONSTRUCTION COST
Currently on track

COMPLETION DATE
2022 (est)

SCHEDULE
Currently on track

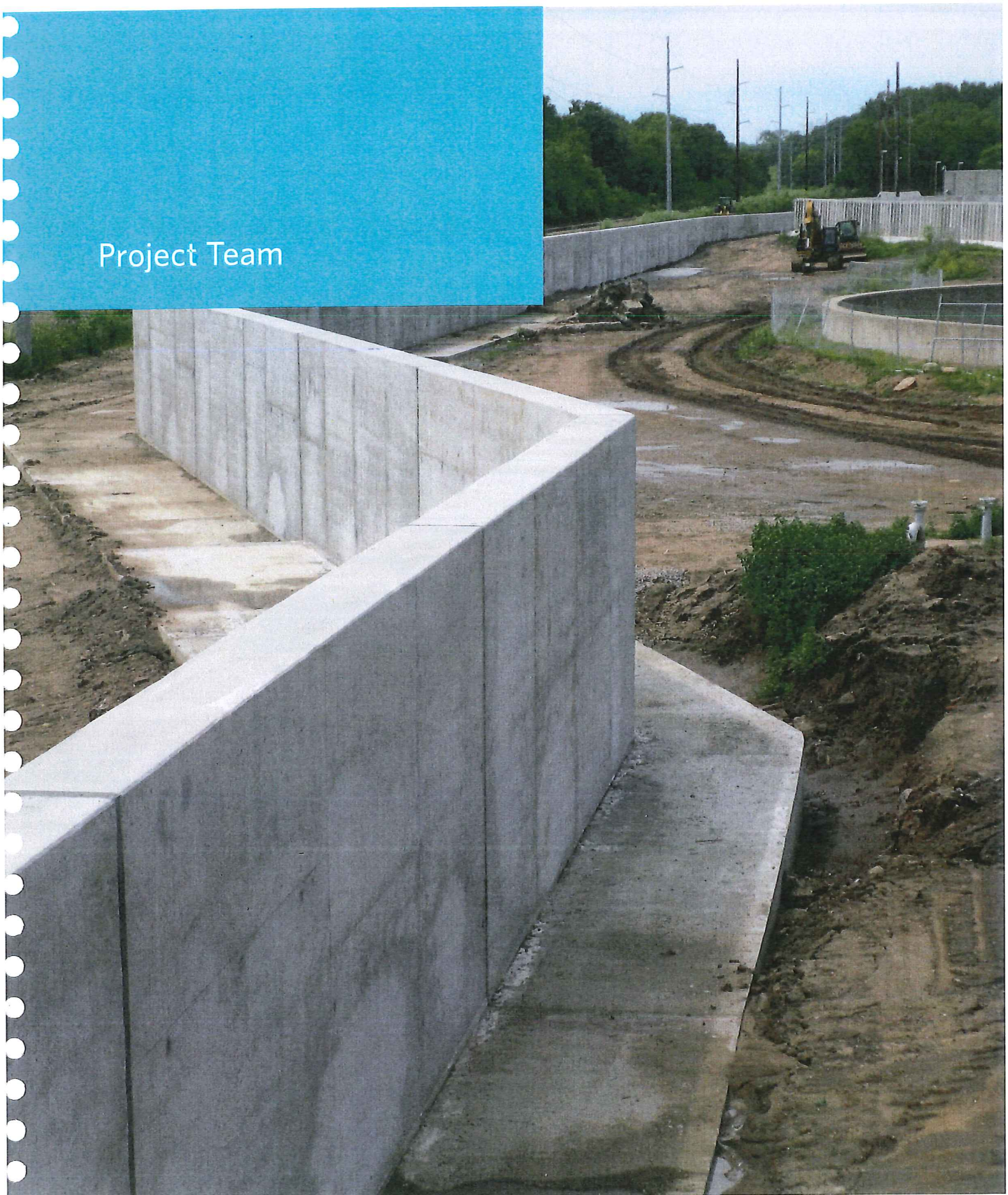
VALUE ENGINEERING
VE services were completed as part of normal HDR procedure

QUALITY CONTROL
All QC procedures were followed per client & HDR agreed upon terms.

The Tomahawk Creek WWTF is located in Leawood, KS and falls within the Indian Creek floodplain. A major design issue for this project was to have access to the site during flood events and provide flood protection up to the 500-year level to meet the floodplain development ordinance for a critical facility. To address flooding all proposed electrical and mechanical equipment at these locations have been elevated above the 500-year flood. As part of the expansion project, the entrance road will be elevated to provide access to the site for the 100-year event with minimal overtopping (<7 inches) during a 500-year event. An overflow/bypass channel is being constructed that will split the plant site in two and achieve a "no-rise" condition. To connect the two sites a bridge will be constructed across the overflow channel for the main entrance. To meet secondary entrance requirements for emergency vehicles, a low water crossing will be provided.

Staff Involved: John Denlinger, Trent Stober, Brandon Coleman, Dave Wiseman, Ron Sova, Vince Fallon, Lance Worth, Kevin Thernes, Keith Froscheiser

Project Team



Project Team

The HDR team brings great strength with both local and national expertise in flood protection. With **HDR**, **PPI**, and **GeoEngineers** offices in Springfield, we can be on site quickly and be responsive during all phases of the project, as has been demonstrated during our previous work. The team members identified for your project were selected based on their capabilities and expertise and for their availability to effectively work on this project for its duration.

HDR, PPI and GeoEngineers have worked closely together on previous projects. PPI will provide the outstanding geotechnical drilling and analysis services you have become accustomed to and GeoEngineers will provide the geophysical insights needed for a successful project.

City of Branson™ MISSOURI

PROJECT MANAGER
Charlie Sievert, PE

TECHNICAL ADVISORS/ QUALITY CONTROL
Mike Butterfield, PE
John Denlinger, PE, CFM

DESIGN ENGINEER LEAD
Eric Dove, PE

SUPPORT STAFF

GROUNDWATER MODELING
Nathan Rossman, PE

MODELING
Neil Parks, PE

PLANT RESILIENCY
Brandon Coleman, PE
Travis Heier, PE

LEVEE CERTIFICATION
Vicki Twerdochlib, PE, CFM

CLIMATE CHANGE
Mike McMahon, ENV SP

FUNDING
Derek Gardels, PE

STRUCTURAL
Dave Wiseman, PE
Wes Jacobs, PE

GEOTECH
Patrick Poepsel, PE
Palmerton & Parrish
GeoEngineers

CADD
Darren Cook, PE

SURVEY
Johnny Yakle, PLS

Charlie Sievert, PE

Project Manager

After 6 years in the US Army as a Combat Engineer and nearly 29 years as a Civil Engineer, Charlie has completed studies, designs, and construction phase services on an extremely diverse array of flood protection, wastewater, water, and linear systems projects. Whether it was working his way up the ranks in the Army, or the past 29 years as a Consultant, Charlie has focused on the strength of teamwork, quality of work, integrity, trust, and respect. His can-do attitude has taken him around the world leading diverse project teams on challenging projects. Known for his collaborative approach, Charlie assembles the best staff and partners with his Clients for successful projects.

EDUCATION
M.S. Water Resources, University of Kansas, 1994

B.S. Civil Engineering, Michigan Technological University, 1990

REGISTRATIONS
Professional Engineer - MO, KS, NE

YEARS OF SERVICE AT HDR
>1

YEARS OF INDUSTRY EXPERIENCE
28

RELEVANT EXPERIENCE

City of Branson, MO – multiple projects with the City of Branson at both the Cooper Creek WWTP and Compton Drive WWTP. Charlie was the Project Manager for the Compton Drive WWTP Flood Protection – Phase 1 Conceptual Design, and makes himself available to Staff if questions come up on miscellaneous items.

City of Mission, KS – Charlie served as the City Engineer for Mission, Kansas for 7 years through the engineering firm he was representing. Charlie lead the study, design, and construction of six major flood control projects totaling over $25M in construction cost, including a certified floodwall to protect part of the business district. The City's elected officials were very impressed with Charlie's service to the City and named a day in his honor.

Eric Dove, PE

Lead Design Engineer

Mr. Dove has 29 years of experience which includes a wide variety of water resources endeavors. He has been a team leader, project manager, design engineer, and lead modeler for flood control, water supply and recreational dams, fisheries improvement, dredging, detention ponds, water quality improvement, wetland mitigation, FEMA mapping, breach analysis, benefit-cost analysis, watershed protection plans and stream restoration designs. Mr. Dove has also provided IDIQ services to the USACE Omaha District and has an extensive modeling background.

EDUCATION
Bachelor of Science, Civil Engineering, University of Nebraska, Lincoln, 1993

Master of Science, Civil Engineering, University of Nebraska, Lincoln, 2003

REGISTRATIONS
Professional Engineer - MO, KS, NE, OK

YEARS OF SERVICE AT HDR
5

YEARS OF INDUSTRY EXPERIENCE
29

RELEVANT EXPERIENCE

- **Oak Star Bank Bioretention and Flood Control Basin**, Springfield, Missouri
- **Finley Creek Floodplain Mapping**, Private Client
- **Line Creek FEMA buy-outs and Watershed Study**, City of Kansas City, Missouri
- **Beechwood Sub-Division Flood Control Project**, City of Springfield, Missouri

NAME/ROLE	YEARS OF EXPERIENCE INDUSTRY/ HDR	PROFESSIONAL REGISTRATIONS	EDUCATION	DES MOINES WRF FLOOD PROTECTION	OMAHA 2019 FLOOD RESPONSE	CEDAR RAPIDS FLOOD CONTROL	TOMAHAWK CREEK WWTF	VA MEDICAL CENTER FLOODWALL DESIGN	PLATTSMOUTH EXPERIENCE	DISASTER RECOVERY EXPERIENCE
KEY TEAM MEMBERS										
Mike Butterfield, PE Technical Advisor/QC	17 years/ 14 years	Prof. Engineer - Civil (NE, IA)	BS, Civil Engineering	◆	◆	◆			◆	◆
John Denlinger, PE, CFM Technical Advisor/QC	29 years/ 18 years	Prof. Engineer - Civil (MO, KS, NE, IA) Certified Floodplain Manager	BS, Civil Engineering				◆			◆
Nathan Rossman, PhD, PE Groundwater Modeling	3 years/ 3 years	N/A	PhD - Earthscience, MS & BS - Geoscience		◆	◆			◆	◆
Neil Parks, PE, CFM HEC-RAS Modeling	5 years/ 5 years	Prof. Engineer - Civil (MO) Certified Floodplain Manager	BS, Civil Engineering				◆			◆
Brandon Coleman, PE Plant Resiliency	20 years/ 20 years	Prof. Engineer - Civil (MO)	BS, Civil Engineering				◆			◆
Travis Heier, PE Plant Resiliency	15 years/ 12 years	Prof. Engineer - Civil (MO, KS, AR)	MS & BS - Civil							◆
Vicki Twerdochlib, PE, CFM Levee Certification	20 years/ 12 years	Prof. Engineer - Civil (NE, ND, IA, FL) Certified Floodplain Manager	BS, Civil Engineering	◆	◆			◆		◆
Mike McMahon, ENV SP Climate Change	34 years/ 11 years	ISI Envision Sustainability Professional	BS - Meteorology	◆		◆			◆	◆
Derek Gardels, PE Grant Funding	9 years/ 8 years	Prof. Engineer - Civil (NE)	MS & BS, Civil Engineering		◆					◆
Dave Wiseman, PE Structural Engineer	34 years/ 27 years	Prof. Engineer - Civil (MO, KS, CO, WA, IA, AR, IL)	MS, Structural BS, Civil Engineering				◆			◆
Wes Jacobs, PE Structural Engineer	21 years/ 4 years	Prof. Engineer - Civil (LA, MS, GA, TX, VA, NY)	BS, Civil Engineering					◆		◆
Pat Poepsel, PE Geotechnical Engineering	34 years/ 29 years	Prof. Engineer - Civil (NE)	MS & BS, Geotechnical Engineering	◆	◆	◆		◆		◆
Darren Cook CADD	21 years/ 5 years	N/A	N/A							◆
Johnny Yakle, PLS Survey	27 years/ 9 years	Prof. Land Surveyor (MO, KS)	N/A				◆			◆
ADDITIONAL RESOURCES										
John Engel, PE Floodwall/Levee	25 years/ 23 years	Prof. Engineer - Civil (NE)	MS & BS, Civil Engineering	◆	◆	◆		◆		◆
Andy McCoy, PhD, PE Missouri River Hydraulics	19 years/ 14 years	Prof. Engineer - Civil (IA)	PhD, MS, & BS, Civil Engineering	◆	◆	◆				◆
Jeremy Cook Benefit Cost Analysis	19 years/ 13 years	N/A	MS & BS, Economics/Finance	◆	◆			◆	◆	◆
Chris Malinowski, PE Operations & Maintenance	32 years/ 6 years	Prof. Engineer - Civil (TX), WWTP Operator (TX)	BS, Civil Engineering		◆		◆			◆
Keith Froscheiser, PE Construction Services	24 years/ 17 years	Prof. Engineer - Civil (NE)	BS, Civil Engineering		◆		◆			◆
Vince Fallon, CDT Architectural	31 years/ 19 years	Construction Documents Technologist	BS, Engineering Technology		◆	◆	◆	◆		◆
Lance Worth, PE, CEM Mechanical	9 years/ 5 years	Prof. Engineer - Mechanical (NE), Certified Energy Manager	MS & BS, Architectural Eng		◆	◆	◆		◆	◆
Kevin Thernes, PE Electrical/I&C	29 years/ 21 years	Prof. Engineer- Electrical (NE)	BS, Electrical Engineering		◆	◆	◆		◆	◆
Trent Stober, PE Wastewater Permitting/ Regulatory Strategy	27 years/ 6 years	Prof. Engineer - Civil (MO)	MS, Civil, BS, Mechanical Eng		◆	◆	◆			◆
Matt Wigle, ENV SP FEMA/Resiliency	30 years/ 10 years	ISI Envision Sustainability Professional	MS & BS, Civil Engineering		◆			◆		◆
Ron Sova, PE Technical Advisor	34 years/ 32 years	Prof. Engineer - Civil (NE)	MS & BS, Civil/ Sanitary Engineering		◆	◆	◆		◆	◆

Palmerton & Parrish

Drilling Sub-Consultant

PPI's Drilling Services Department includes ten (10) drill rigs, extensive tooling and support equipment, and numerous experienced Lead Drill Operators. PPI's Project Management staff is skilled at designing and executing subsurface investigation programs tailored to nearly any geologic setting and project type.

PPI provides subsurface drilling services in support of the Project Types listed below, as well as many others.

Traditional Subsurface Investigations

- Soil Sampling including thin-walled and thick-walled Shelby tubes, split spoons, and continuous sampling.
- Rock Coring including NQ2-, HQ-, and PQ-diameter tooling.

Piezometer and Monitoring Well Installation

- Licensed Well Installers in MO, KS, and OK
- OSHA 40 Hr. HAZWOPER Trained
- Experience with PVC and Steel Well Construction in a variety of geologic settlings

Drilled Pier Pre-Drilling

- Capability to mobilize multiple drill rigs to accelerate Project schedules, help define quantities for drilled pier construction, and establish drilled pier bottom elevations in competent rock in accordance with the Project Plans and Specifications

Quarry Investigations

- Ability to core up to 400 feet of depth.
- PPI's aggregate laboratories are equipped to complete a full battery of characterization testing, including sulfate soundness, durability, and L.A. Abrasion.

Contract Drilling

- PPI provides Contract Drilling Services for a variety of Clients in support of downhole geophysical applications, railroad, highway, and utility projects.

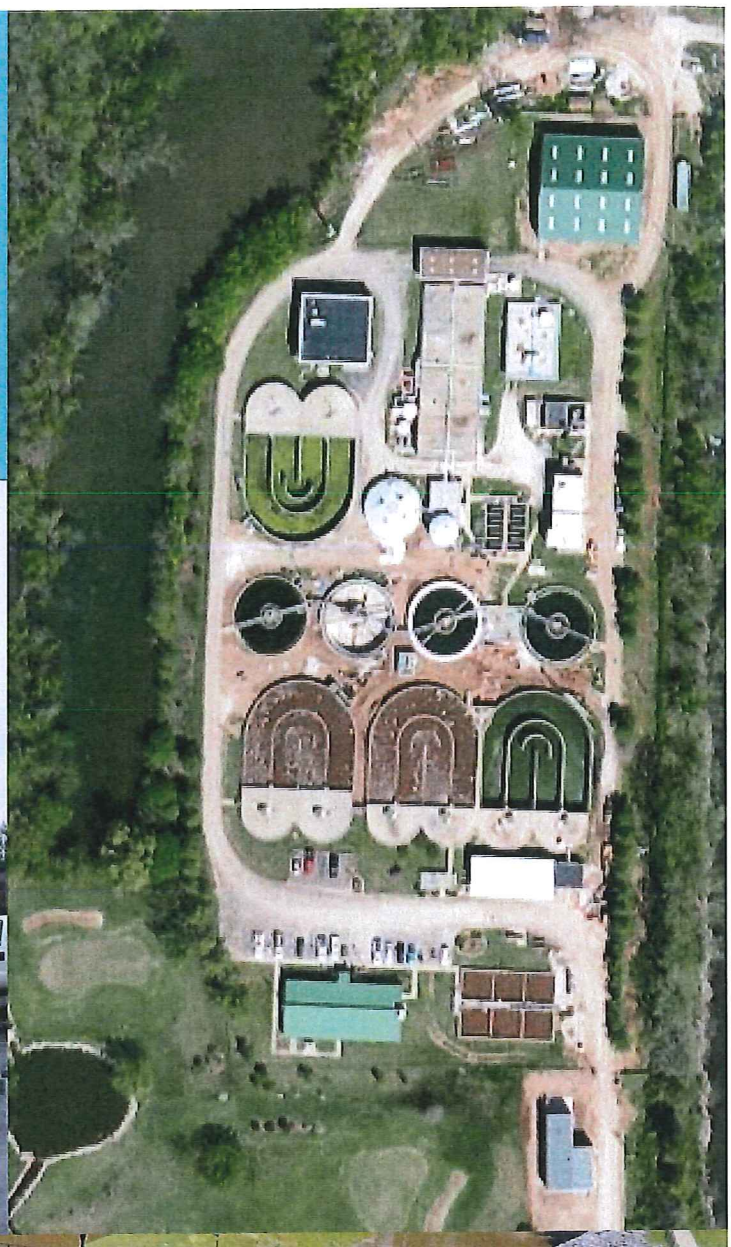
GeoEngineers

Geophysical Sub-Consultant

GeoEngineers is an employee-owned company, established in 1980, that uses earth science and engineering to improve communities and protect our world. From underground pipeline installation to habitat repair, wherever human development intersects with the environment, we'll be there.

At GeoEngineers, people come first. Their foundational principles of integrity, client service, and quality work have propelled GeoEngineers' growth from a small consulting partnership to a multidisciplinary team of more than 300 people in 13 offices nationwide. Explore our projects to see examples of what our team can do.

References



References

USACE - Kansas City District

John Grothaus, Program Manager, 601 E. 12th Street, Kansas City, Missouri 64106, 816.389.3110

For the past two decades, HDR has been a preferred provider of engineering services directly for the U.S. Army Corps of Engineers. We have successfully executed flood risk management projects throughout the State of Missouri and beyond across all phases including planning, design, construction, and operations. HDR understands the federal requirements, policies, and procedures and has successfully leveraged cost-shared funding to build strong partnerships and leverage available resources.

Unified Government of Wyandotte County/Kansas City, Kansas

Trenton Foglesong, Water Pollution Control Lead Engineer, 50 Market Street, Kansas City, KS 66118, 913.573.1362

The UG has initiated expansion of the Wolcott WWTP located within the Missouri River floodplain. To determine the impacts of the proposed expansion fill a HEC-RAS 2D model was created to assess the water surface impacts and localized velocities on the fill slopes. A flood event on the Missouri River in March and April 2019 was used to validate the model. After the initial existing conditions model was developed, the 2019 flood event was run through the model and water surface elevations were checked against those recorded by the USGS at the I-435 bridge stream gage. The model results were used to inform the embankment design for the project site to ensure the slopes will not be compromised during a flood event. The HEC-RAS model is also used to support the No Rise analysis of the plant outfall along Conner Creek.

City of Plattsmouth, Nebraska

Ervin L. Portis, City Administrator, 136 North 5th Street, Plattsmouth, NE 68048, 402.296.2522 ext 302

Project is located within the Missouri River floodplain, HDR personnel were onsite throughout flooding event providing support and recommendations, HDR completed the damage assessments for both the water and wastewater plants, worked with FEMA personnel, ***HDR prepared the Hazard Mitigation Grant Program*** *funding application and the City received funding to help complete the needed repairs.*

City of Council Bluffs/Iowa Department of Transportation (IDOT)

Matt Cox, Public Works Director, 209 Pearl Street, Council Bluffs, IA, 712.328.4634

HDR investigated subsurface conditions and utilized the state-of-the-practice software SEEP/W and SLOPE/W to analyze the new levees and to design underseepage control measures, Section 408 submittals to the USACE which included the design of temporary ring levees to provide flood protection during construction, and engineering analysis of slope stability, underseepage, and settlement of the earthen embankments, HDR conducted a Damage Assessment in accordance with USACE Repair and Inspection Program (RIP) guidance to address temporary and permanent rehabilitation.

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Springfield, MO 65804
417.351.6500

hdrinc.com

We practice increased use of sustainable materials and reduction of material use.