

**CITY OF LA VISTA  
MAYOR AND CITY COUNCIL REPORT  
AUGUST 19, 2014 AGENDA**

<b>Subject:</b>	<b>Type:</b>	<b>Submitted By:</b>
THOMPSON CREEK PHASE VI, PART 2 GRANT APPLICATIONS	◆ RESOLUTION ORDINANCE RECEIVE/FILE	JOHN KOTTMANN CITY ENGINEER/ASSISTANT PUBLIC WORKS DIRECTOR

**SYNOPSIS**

A resolution has been prepared authorizing the submittal of a grant application for work associated with Part 2, Phase VI of the Thompson Creek project. This application pertains to a second year funding from the NDEQ for the project.

**FISCAL IMPACT**

The FY 14 and proposed FY 15 Capital Budget has funding for the City's portion of the project in anticipation of grants being received.

**RECOMMENDATION**

Approval

**BACKGROUND**

The City is proposing to submit a grant application to the Nebraska Department of Environmental Quality (NDEQ) for a second year of funding from this agency for the Thompson Creek project, which will include stream channel improvements and watershed management activities. The application is due by September 2, 2014. This application is a pre-requisite to applying to the Papio-Missouri River NRD for funds from their Urban Drainageway Program at the 60% level. Grants have been received from the NET and the NRD.

The City's consultants (TD2, RDG, and AES) along with City staff have prepared the grant application for the NDEQ including a 9-Element Watershed Management Plan as required by the EPA for use of the Nonpoint Source Funds being distributed by the NDEA. Activities to be funded by this grant include construction of the channel improvements. Other activities will include methods to improve watershed management and water quality. This will include public education, citizen engagement, water quality monitoring, demonstration projects, and programs that may promote the use of rain barrels, downspout redirection, rain gardens or other methods to reduce runoff volume and improve water quality reaching Thompson Creek.

A resolution has been prepared to authorize submittal of the application.

Success of the application will not be known for several months.

**RESOLUTION NO. \_\_\_\_\_**

A RESOLUTION OF THE MAYOR AND CITY COUNCIL OF THE CITY OF LA VISTA, NEBRASKA AUTHORIZING THE SUBMITTAL OF A GRANT APPLICATION TO THE NEBRASKA DEPARTMENT OF ENVIRONMENTAL QUALITY (NDEQ) REQUESTING FUNDS FOR WORK ASSOCIATED WITH PHASE VI, PART 2, YEAR 2 OF THE THOMPSON CREEK PROJECT IN LA VISTA NEBRASKA.

WHEREAS, the City Council of the City of La Vista has determined that said Thompson Creek improvements are necessary; and

WHEREAS, the FY 13/14 and proposed FY 14/15 Capital Budget has funding for the City's portion of the project in anticipation of grants being received; and

WHEREAS, submittal of a grant application to the Nebraska Department of Environmental Quality (NDEQ) is necessary; and

WHEREAS, the City's consulting firms on this project, RDG, TD2, and AES have prepared the grant application for the NDEQ; and

WHEREAS, the City will authorize submittal of this application for funding, based on the City Council's understanding of the fiscal commitments involved in the application and a general outline of the scope of work that will be involved if the grants are approved;

NOW, THEREFORE BE IT RESOLVED, by the Mayor and City Council of La Vista, Nebraska, authorizing the City Administrator to sign the grant application to the Nebraska Department of Environmental Quality (NDEQ) requesting funds for work associated with Phase VI, Part 2, Year 2 of the Thompson Creek Project in La Vista, Nebraska.

PASSED AND APPROVED THIS 19TH DAY OF AUGUST, 2014.

CITY OF LA VISTA

\_\_\_\_\_  
Douglas Kindig, Mayor

ATTEST:

\_\_\_\_\_  
Pamela A. Buethe, CMC  
City Clerk



## Nonpoint Source Pollution Management Project 2014 Proposal Application

### Application Form

The following information and formatting is required for all proposals. Failure to use the following forms in the prescribed formats and to furnish the information requested may disqualify the proposal. If these requirements cannot be addressed with existing information, a plan and schedule describing how the requirements will be met in the early phases of the project must be included.

- The proposal application MUST be submitted on these forms. If necessary, additional forms are available online at <http://deq.ne.gov>
- Item #6, Budget Summary, is an estimated range and will be finalized at a later time.
- Item # 9, the *brief* project overview, should not be longer than the space provided.
- The *Instructions for Completing the NPS Proposal Application* may offer additional information for completing these forms.
- Read the Request for Proposals carefully.
- Complete the Proposal Application Forms in their entirety including a DUNS number.
- A confirmation e-mail will be sent after NDEQ receives the proposal. Please contact Linda Rohn at (402) 471-3098 if you do not receive a confirmation e-mail after submitting a proposal.

Submit **One Hard Copy** of the proposal by **4pm Sept. 2, 2014** to:

Nonpoint Source Program  
Nebraska Department of Environmental Quality  
1200 N Street, Suite 400  
P.O. Box 98922  
Lincoln, NE. 68509

## 2014 NPS PROPOSAL APPLICATION FORMS

**1. Project Title:** The Thompson Creek Watershed Restoration: Phase II

<b>2. Sponsor Contact Information</b>	
Organization	City of La Vista
DUNS #	05 456 1071
Street Address	9900 Portal
City	La Vista
State	Nebraska
Zip	68128
Primary Contact	John Kottmann, City Engineer/ Assistant Public Works Director
Phone Number	402.331.8927
E-mail Address	jkottmann@cityoflavista.org

<b>3. Partners</b>		
Organization	Contact Name	Phone Number
Papio-Missouri Natural Resources District	Eric Williams	(402) 444-6222

**4. Project Location (closest city):** La Vista, Nebraska

**5. Project Period (month/year) : Start Date:** Oct. 31, 2014 **End Date:** Oct. 31, 2015

<b>6. Budget Summary</b>	
Source	Dollar Amount
319 Funds	\$300,000
Non-Federal Funds	\$1,400,000
Other Federal Funds	\$0
<b>Total</b>	<b>\$1,700,000</b>

<b>7. Project Type (Check One)</b>	
<input checked="" type="checkbox"/> Watershed	<input type="checkbox"/> Local Outreach
<input type="checkbox"/> Waterbody	<input type="checkbox"/> Statewide Outreach
<input type="checkbox"/> Groundwater Area	

**8. Has the sponsor received any previous Section 319 Grants?**  YES  NO

**9. In the space below** provide a brief overview of the project for which you seek funding. Fit this overview within the box below. If you are asking for 319 Funds for only a portion of the overall project, indicate the components for which you seek funding.

With the completion of the design/initiation phase, the City of La Vista is well poised to continue its restoration of the urban 1,250-acre Thompson Creek in Phase II of the Thompson Creek Watershed Restoration. The creek currently suffers from degraded water quality, eroding banks, flooding, and impaired aquatic and riparian habitats. In Phase II we will address these issues by re-meandering the channel, stabilizing stream banks, constructing instream pool/riffle habitat, and restoring native, deep-rooted perennial herbaceous vegetation in the riparian zone. Phase II will continue to address stormwater management and removal of TSS by retrofitting stormwater outfalls with hydrodynamic separators paired with constructed end-of-pipe treatment wetlands. Also addressing stormwater, we will continue implementing BMPs (i.e., rain gardens, rain barrels, downspout redirection, and street planters) on private and public lands. Pre-construction monitoring data from 2013-14 (macroinvertebrates, bank stability, pollutants, in-stream flow) will be re-measured after construction. An outreach program conducted by the City, aided by the local Nebraska Watershed Network who facilitated an annual public participation BioBlitz, is a model for other urban watersheds to emulate in their efforts to build robust advocacy by stakeholders.

**10. Budget**

BUDGET CATEGORY	SOURCE of FUNDS			
	Section 319 Funds	Other Federal Funds <sup>1</sup>	Non-Federal Funds <sup>2</sup>	TOTAL
Personnel	10,000	0	15,000	25,000
Material & Supplies	0	0	3,000	3,000
Travel	0	0	0	0
Equipment	0	0	0	0
Contractual	290,000	0	1,382,000	1,672,000
<b>TOTALS</b>	<b>\$300,000</b>	<b>\$0</b>	<b>\$1,400,000</b>	<b>\$1,700,000</b>

**1. Sources of Other Federal Funding**

Name	Amount \$
NONE	0

**2. Sources of Non-Federal Funding**

Name	Amount \$
Nebraska Environmental Trust	600,000
City of La Vista	400,000
Papio-Missouri River NRD	400,000

## 11. Project Description

**1. Background.** The 1,250-acre Thompson Creek Watershed in the City of La Vista (Sarpy County), Nebraska, with its associated signature parks and proximity to the City Hall, is a significant natural resource for the City. This urban watershed, comprising residential and more urbanized areas, flows east for about 2 miles to a confluence with a channelized section of Big Papillion Creek (HUC 12 Big Elk Creek-Big Papillion Creek 102300060205). Big Papillion is an impaired waterbody in the State (Category 2) as well as State non-point area of interest. It is logical to assume that water quality improvements in Thompson Creek will help address the impairment in downstream waters.

In 2009, the Papillion Creek Watershed Partnership completed a plan to address watershed nonpoint pollution sources and flow and volume. Based on a 2006 study of the channel, a FEMA grant enabled acquisition of 24 flood-prone residences to provide room for stream improvements. The Papio-Missouri River Natural Resources District (NRD) is also involved. The initial watershed project plan evolved into a nine-element watershed plan slated for approval by the USEPA in 2014. This ongoing project (Phase II with this proposal) is integrated with this Thompson Creek Watershed Management Plan (TCWMP) to address nonpoint source (NPS) issues through these stream restoration and naturalization actions: stabilizing stream banks; creating instream pool-riffle habitat; raising the stream bed; re-meandering the stream; and restoring native riparian vegetation. These practices are complemented by runoff management best practices on public and private property that include rain barrels, downspout redirection, rain gardens, street planters, and retrofitted stormwater outlets. Finally, the City is working in concert with a local presence, the Nebraska Watershed Network (NWN), to create a model program that facilitates public outreach and citizen engagement with the watershed through a variety of approaches and hands-on activities (e.g., BioBlitz, see Section 7).

The Thompson Creek Watershed extends from its western headwaters to 66<sup>th</sup> Street near Papillion Creek (Map, Section 10) and encompasses various land use types including residential neighborhoods, commercial/institutional areas and open space (parks, golf courses). The overall goal of the project is to improve the ecological functioning and health of the entire watershed. To maximize the return on every dollar spent within the watershed, restoration activities in Phase II of this project will focus on areas depicted on the map in Section 10 as 2, 3 and 4—the most severely channelized and urbanized portions.

Phase I of this project (see approved Project Implementation Plan or PIP), focused on initial education/outreach, cost-share/demonstration projects (including installing a variety of BMPs), preparation for Phase II utility relocation coordination, and design of creek reconstruction. At this point in the project: (a) the production of design and construction documents for the proposed Phase II creek and outlet restoration work are to be put out for bid in January 2015; (b) a number of cost-share demo projects have been completed (30 rain barrels, 1 street planter under contract for construction, 4 rain gardens being built, 25 homes identified for potential downspout relocation); (c) the relocation of utilities outside the riparian corridor is slated for Nov-Dec 2014; (d) 3 rounds of pre-construction monitoring have occurred under an approved QAPP and analysis and reporting is underway; and (e) education and outreach activities underway have included 4 fact sheet brochures, 31 weekly newsletter, 5 quarterly newsletters, 3 open houses, the first annual BioBlitz event and a City website page:

<http://cityoflavista.org/Index.aspx?NID=611>.

The majority of work proposed in Phase II consists of construction actions that effect stream channel restoration, install hydrodynamic sediment separators and build associated treatment wetlands at the retrofitted stormwater outfalls, as well as additional cost-share demonstration stormwater control projects and two years of post-construction monitoring. In addition, we will continue to build a model program of community education and outreach working closely with a local advocate, the Nebraska Watershed Network (NWN). The formation of a group of local stakeholders is critical for long-term sustainability of the project. The current management practices have been selected based on historical data combined with

anticipation of the unpredictable influences of climate change. Having a robust stakeholder group on board drawn from an informed public will greatly facilitate future adaptive actions.

**2. Objectives.** Implementing the designated management practices of the TCWMP through Phase II of the Thompson Creek Watershed Restoration Project will not only improve the water quality of Thompson Creek but will also contribute to the improvement of the downstream impaired waters of Big Papillion Creek. In addition, the outreach and education portions of the project are already drawing attention to a highly visible community asset whose restoration will improve the quality of life for La Vista residents. The outreach program is designed to serve as a replicable model for stream restoration and community involvement for other urban streams in the region.

Phase II of the Thompson Creek Watershed Restoration Project has the following goals (bold font) and categorical measureable objectives. Details on exactly how the categorical objectives will be accomplished and measured are found in Section 5 and the TCWMP and the QAPP.

**(1) Improve water quality in Thompson Creek and downstream receiving waters**

- To reduce TSS and associated contaminants throughout the watershed by installing stormwater BMPs with effort measured by number, type, and location of installations.
- To directly restore known areas of erosion (e.g. foot bridge at Central Park) through bank grading and planting with success measured by monitoring area of vegetative coverage vs. exposed ground.
- To reduce TSS and associated contaminants through retrofitting stormwater outfalls with SAFL baffles paired with constructed wetlands, with effectiveness measured indirectly through water quality measurements (see below).
- To measure water quality directly through field sampling including in situ measures as well as laboratory measurements of water quality parameters (detailed in QAPP) before (3 rounds completed) and after restoration (2 rounds planned). Targeted reductions listed in the TCWMP.

**(2) Naturalize Thompson Creek and reduce flooding and damage to infrastructure and property**

- To re-meander the channel, stabilize stream banks, and reconstruct a floodplain bench, with effort measured by linear feet restored, reduction in eroding banks by 80%, and documented by photographs.
- To construct in-stream habitat (i.e., pool-riffle), with results measured by linear feet restored with in-stream habitat, bank stability, and aquatic macroinvertebrate diversity measured using USEPA Rapid Assessment Protocols.
- To restore native, deep-rooted perennial vegetation to riparian areas via canopy clearing and planting, with effort measured by square feet restored.
- To treat the first ½ inch of runoff by 2023, accounting for about 90% of pollutant loadings as estimated by the cumulative benefit of stormwater management actions.
- To measure the projected 25% reduction in peak flows of the 2-year, 24-hour storm (3 inch) compared to existing baseline. (A stage-discharge relationship has been established through sampling and analysis in 2013 and 2014. Measurements from the USGS gauge showed discharge to vary from 1 cfs to 106 cfs for storms, producing stream elevations of 6.9 and 9.9 feet respectively, with the majority of discharges at 30-70 cfs. We still lack data sufficient to directly calculate the cfs associated with the 2-year, 24-hour storm but this will be possible as more data are collected encompassing the target storm event. )

**(3) Create sustainable public support for the project**

- To increase awareness of individual property contributions to non-point source pollution measured through BMP installations, with spatial and temporal participation tallied.
- To foster public understanding of linkages between non-point source pollution, water quality, stream health, biodiversity and the community's quality of life, as measured by number and

diversity of events, types of publicity, and number and diversity of participants, and feedback from events.

**3 & 4. Pollutant Sources and Pollutant Loads.** Pollutants are those typical of urban watersheds and include nutrients (e.g., nitrogen, phosphorus), suspended solids and sediment, hydrocarbons, metals, and bacteria (e.g., *E. coli*). Sources, also typical of urban watersheds, include: (a) stream channel erosion, (b) diffuse and acute soil erosion, (c) street and parking lot runoff, (d) runoff from residential and commercial lawns, golf courses and manicured park lands, and (e) pet and wildlife waste. The downstream receiving water, Papillion Creek, is listed as impaired for *E. coli* at the point where Thompson Creek discharges, although Thompson Creek itself is not so listed. Given the well-established correlation of *E. coli* and TSS, efforts to reduce the latter in Thompson Creek will almost certainly reduce *E. coli* levels in Thompson Creek as well as address the Papillion Creek impairments downstream.

Excess stormwater volume and runoff rates also contribute to poor water quality through acceleration of erosion and augmentation of flooding. Runoff volume and velocity are exacerbated by increased areas of impervious surfaces and further compounded by engineered collections of conveyance devices whose purpose is to move water out of urban areas as quickly as possible. On Thompson Creek, an additional 50% impervious surface in the watershed area below Central Park/Edgewood Boulevard increases flow at 72<sup>nd</sup> Street by nearly 100% (1347 cfs to 2541 cfs for the 100-year event).

We estimated pre-restoration nonpoint pollutant loads for the watershed using the WinSLAMM model (PV & Associates, LLC). The urban water quality model evaluated runoff volume and loading of various pollutants related to individual land uses and individual small and medium rain fall events for particular source areas within the watershed, which allows for a more targeted implementation of BMPs to address "hotspots." Using this modeling, the watershed's land surface is estimated to contribute about 0.5 ton of total suspended solids (TSS) per acre per year. This equals a yearly pollutant loading from the entire watershed of 650 tons of TSS. These runoff factors create beneficial use impairments (BUIs) in the watershed. They degrade in-stream habitat by burying or eroding spawning and feeding habitat for fish and macroinvertebrates and by creating extreme hydrological conditions (frequent flooding and drying cycles) that inhibit colonization by aquatic animals and plants. In addition, the resultant scouring causes bank erosion and eliminates functional, diverse vegetated riparian habitat with habitat ramifications for a wide diversity of terrestrial and aquatic organisms.

Thompson Creek Watershed exhibits multiple effects from poorly managed stormwater runoff. In many places the stream channel is deeply-incised (7 to 15 feet) with severe bed and bank erosion from volatile flows. There is a lack of dense-rooting herbaceous vegetation on steep (2:1 horizontal:vertical) stream banks. In addition, there is a lack of floodplain storage capacity below the detention basin in La Vista Falls Golf Course. There are documented damages and threats to infrastructure and public and private property throughout the watershed resulting from the stream's unstable flow regime. In addition, stormwater treatment has not been sufficient to filter out fine sediments, orthophosphates, and other dissolved pollutants; eutrophication of still waters (e.g., algal blooms, odor) results from direct input of excess phosphorus. BMPs intended to remove such dissolved pollutants are being installed to treat runoff into Thompson Creek from subwatersheds 2, 3 and 4 (map, Section 10).

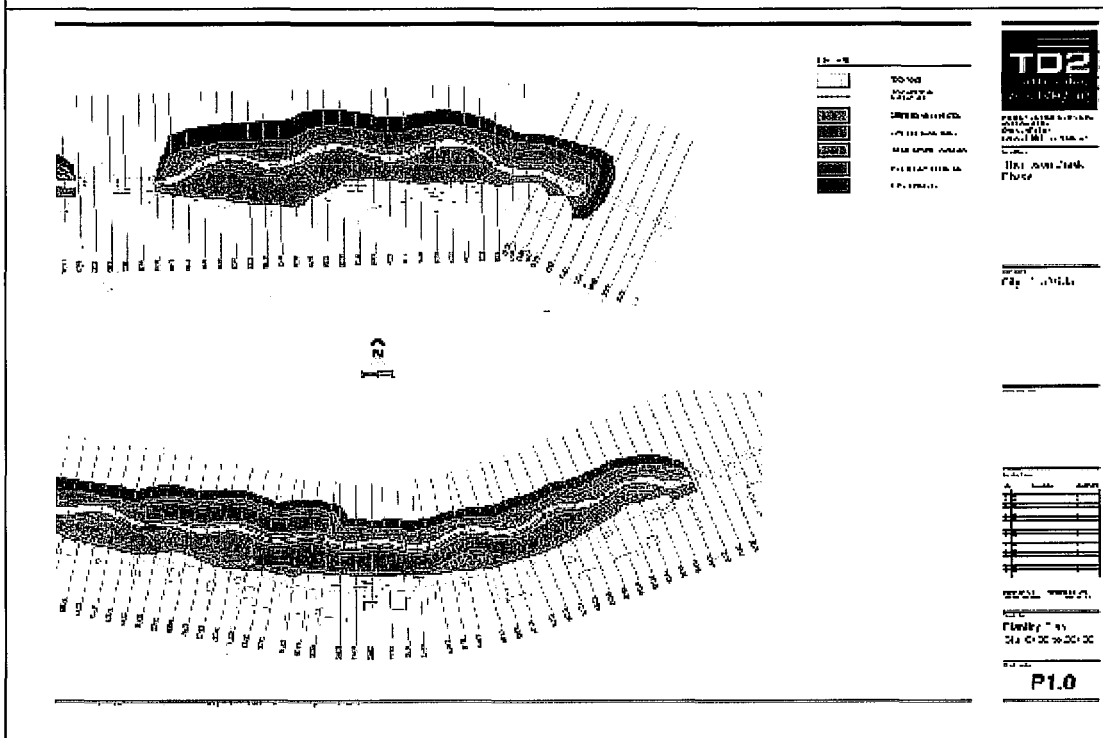
**5. Management Practices.** In Phase II we will: (a) reconstruct an eroding portion of Thompson Creek extending from Edgewood Boulevard to 72<sup>nd</sup> Street and also address erosion at a foot bridge in Central Park, (b) retrofit storm sewers with SAFL baffles (a proprietary hydrodynamic separator), paired with constructed treatment wetlands, (c) continue installation of cost-share BMP projects to demonstrate methods to address stormwater runoff at sources and (d) continue public education and outreach (practices detailed in Section 7).



(a) *Stream reconstruction* for 3652 linear feet of the most severely eroding portion of Thompson Creek is designed to reduce the stream's longitudinal slope to a target of 0.5%, promoting optimal stream and floodplain geometry. These actions will, in turn, diffuse runoff energy, balance sediment transport and result in reduced erosion, improved water quality, enhanced aquatic and riparian habitat, and protection of public and private property and infrastructure. Figure 1 illustrates a portion of this plan.

Using designs from Phase I, stream reconstruction will: (1) Re-meander the channel to provide a dynamically stable channel; (2) Raise the streambed where feasible; (3) Stabilize banks using bioengineering techniques (soil lifts, approximately 770 l.f.) (4) Address a specific problem erosion area (footbridge at Central Park); (5) Install approximately 13 low-head grade controls (cross vanes); (6) Construct pools and riffles; (7) Reconstruct floodplain bench; (8) Restore native vegetation on bank by eliminating most of the canopy (shade) and planting deep-rooted native, perennial herbaceous species.

Figure 1. Planting plan in the lower 40% of Thompson Creek illustrates the intended reconstruction including meanders and control structures (low-head cross vanes).



(b) *Four (4) Stormwater outlets* in the reconstructed reach will be retrofitted with hydrodynamic separators (SAFL Baffles (St. Anthony Falls Laboratory, (<http://stormwater.saf1.umn.edu/updates-december-2011>)) paired with treatment wetlands to manage watershed runoff. These baffles have been found to remove 45-55% of TSS while allowing easy access for cleaning and maintenance. Treatment wetlands, integrated within the creek's reconstructed meanders, receive discharge from each retrofitted outlet. A hydraulic head is created that pushes water through an engineered filter at each outlet, removing additional TSS and phosphorus as well as recharging groundwater to maintain creek baseflow.

(c) *Cost-share BMP demonstration projects* will be continued, installed on residential (single and multi-dwelling) and public properties. (Phase I projects listed in Section 1.) Phase II demo projects include (a) 30 downspout redirections, (b) 25 rain barrels, (c) 4 rain gardens, (d) 1 street planter on public rights-of-way, (e) 1 bio-swale on school property, and (f) 1 bio-retention basin on school property. These BMPs will demonstrate techniques to prevent runoff to storm sewers from impervious surfaces, reduce runoff volume, and capture the most polluted first flush.

**6. Stakeholder Participation.** Stakeholders have been involved in the watershed project since its inception. Prior to the current project, the City worked with landowners to identify flood-prone properties adjacent to the stream with the intent of purchase and removal to allow creation of a new riparian park. Specific input on the stream restoration project has been continually sought through the City's master planning process. Finally, education and outreach will continue to build stakeholder equity. Spatial records of BMPs and lack of implementation will be used to identify areas needing additional outreach.

**7. Education and Outreach.** Phase II continues the ongoing model education and outreach program. Activities include web and print-based communications, open houses, and volunteer activities focusing on teachers and students in the Papillion-La Vista School District. A partnership with University of Nebraska Omaha (UNO) has recruited students to do water quality/macroinvertebrate monitoring. Phase II will add rain garden education and increased involvement with schools as well as a repeat of the BioBlitz.

The BioBlitz is a showcase piece of the project's outreach. Organized and facilitated by the Nebraska Watershed Network (NWN) (a UNO-based student-driven organization promoting water quality awareness through outreach, education, and research), this two day event included a 24-hour citizen biological survey of all life forms in the stream and riparian zone. It engaged other stakeholder groups with booths and demonstrations, interactive workshops, hands-on children's activities guided walks by local experts, and more. There are plans to repeat the BioBlitz on an annual basis, allowing citizens to see for themselves the positive changes in Thompson Creek developing from restoration and to continue to build stakeholder support. Other participating organizations included the University of Nebraska-Omaha, the University of Nebraska-Lincoln, the Nebraska Master Naturalists, Nebraska Wildlife Federation, Omaha Children's Museum, Joslyn Art Museum, and the La Vista-Papillion School District.

**8. Monitoring.** To measure improvements post-construction, monitoring will employ the same standard methods and parameters (details in QAPP) that were used to collect preconstruction baseline data. Long-term monitoring (beyond project period) will target participation from local teachers and students. Parameters to be measured are: (a) stream habitat condition and macroinvertebrate community composition; (b) water chemistry; (c) peak flow following runoff event; and (d) bank stability. Stream habitat, macroinvertebrate communities, and bank stability will be measured with an adaptation of the USEPA's Rapid Bioassessment Protocols<sup>1</sup>. Water chemistry will be measured in-situ in the field and also via replicate surface water samples submitted to a qualified laboratory. Peak flow is being measured at a stage gauge in Thompson Creek near the South 72<sup>nd</sup> Street road crossing culvert in consultation with the USGS; this measurement will continue and eventually enable an accurate estimate of reduction in peak flows measured in cfs.

**9. Evaluation Criteria.** Evaluation criteria will assess management practices relative to the goals and objectives of the project using an adaptive management framework. The City Engineer at La Vista will be responsible for monitoring project progress and taking corrective action should problems arise. Specific measures of project progress include, but are not limited to:

- Documentation of problems with BMPs and stream stabilization work, with corrective actions taken.
- Number of residents and students participating in open houses, monitoring, and special events.
- Citizen feedback from the BioBlitz and other focused activities.
- Number of rain barrels, downspout redirections, rain gardens, and street planters installed.
- Linear feet of Thompson Creek restored with meanders, floodplain bench, and riparian vegetation.
- Identification by location, target population and type of actions for additional outreach.
- List of future needed improvements in the watershed.

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<sup>1</sup> Barbour, M.T., J. Gerritsen, B.D. Snyder, and J.B. Stribling. 1999. *Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition*. EPA 841-B-99-002. U.S. Environmental Protection Agency; Office of Water; Washington, D.C.

### 10. Project Map

One page, single-sided, map of project area (if applicable).

