

MEETING DATE: 11/26/07

AGENDA ITEM: Consideration to Award a Contract to Hydrophix for the Design and Construction of the *Culver City Citywide BMP Treatment "Train" Project*

ATTACHMENTS

		<u>Pages</u>
1	Excerpt from Hydrophix proposal dated September 25, 2007	1-23

Proposal for The City of Culver's Citywide Stormwater BMP Treatment Train Project

Submitted by Hydrophix on
September 25, 2007

COPY 1

Project Approach

Project Approach

The City of Culver City's Citywide Stormwater BMP Treatment Train project will integrate both structural and non-structural Best Management Practices (BMPs) to help meet adopted Total Maximum Daily Load (TMDLs) requirements for trash in Ballona Creek. The term "treatment train" describes a treatment system with multiple lines of defense to ensure the maximum pollutant removal possible. While each component of this project can produce results on its own, a more significant reduction in the target pollutants can be achieved by implementing a well-researched and creatively implemented BMP "train" that also incorporates public awareness, education, and behavior change in the community.

Full Capture Catch Basin Inserts

The Los Angeles Regional Water Quality Control Board (Regional Board) adopted the definition of "Full Capture System" in March 2004. This definition is applicable to all receiving waters in the Los Angeles Region identified as being impaired for Trash. Ballona Creek is identified as impaired for trash and also has an adopted TMDL for trash.

To date, five agencies or groups of agencies have submitted and been certified to implement a specific "Full Capture System." The determination and certification of the specific BMP means that it meets the Regional Board's definition of a "full capture system" for the trash TMDL and will allow the system to be used elsewhere in the region. Approval of the systems in new locations is based on the removal efficiency of the target pollutants and monitoring data on the installed systems.

Based on this information and Regional Board staff input, we plan to approach BMP selection for this project by conducting extensive research and data analysis of existing project sites that have installed these "full capture systems." Another important source of information will be the field crews that have installed, and continue to maintain these systems. Their anecdotal information and trash collection data are a significant part of the selection criteria. In addition, input from Regional Board staff that are directly involved with the certification process of "full capture systems" will be another critical component in the selection process.

It is also important to understand the watershed of interest and the various land uses within the watershed. Each land use will not only contribute different amounts of trash and debris, but also a variety of types (plastic, paper, leaves, sediment, etc.) that can affect each catch basin and certified system differently. To get a better idea of the types of trash that affect the various catch basins in the City of Culver City, we plan to meet with and conduct field visits with the City's public works field crews to get a better idea of what they encounter and see on a daily basis in the catch basins throughout the City.

Los Angeles County of Public Works (LADPW) has conducted pilot trash BMP projects in the Ballona Creek Watershed and within selected project catch basins owned by LADPW. To conduct work on and properly access catch basins that are owned by the County, various permits and agreements will have to be completed. We consider this one of the significant milestones for the project, for without the proper documentation the project cannot move forward. Both firms have individuals involved in this project that have long standing relationships with key managers at the LADPW and their staff.

In order to legally work on any county-owned catch basins or county-owned land areas, Culver City will need to insure that the appropriate agreements and approvals are in place prior to starting the project. Based on our experience, the following permits will need to be completed:

- 1) Encroachment Permit to access any County owned property
- 2) Connection Permit if any work will be done upstream of any County owned facility which in this case can be the storm drain system and Ballona Creek
- 3) Construction Permit to construct or alter any part of a County owned system.

To select the appropriate full capture systems, the project team will research available approved devices in use in Los Angeles County. Considerations for selection many include (but are not limited to) ease of design and construction, suitability for retrofit in an existing storm drainage system, capital cost, operations and maintenance requirements, demonstrated pollutant removal effectiveness, longevity, and ease of monitoring. Base on the selected criteria, the project team will develop a selection matrix that will enable us to compare the alternative devices and select one or more that best meet the objectives of the project. Although it is possible that one selected device could function effectively at all 672 locations, the Team is open to considering more than one option.

City Parks BMP I and II

Our firm has evaluated ten parks and other areas as potential sites for rain gardens and a roof downspout disconnect/cistern. Based on our initial evaluation criteria, Culver City Park and the Ivy Substation & Media Park are two potential sites for a rain garden. Syd Kronenthal Park and the Culver City Julian Dixon Library are potential sites for roof downspout disconnects/cistern that capture rain and could also supply water to a nearby rain garden or existing garden. Our initial criteria were based on location of park and location of specific sites within the park (because the location also needs to be a demonstration site), activities that the park offers, location of impervious surfaces to potential rain garden sites, location and structure of buildings for the roof downspout disconnect, and ability to access sites for construction and future maintenance. Six other parks were evaluated but did not meet our initial criteria for reasons such as; a large portion of some parks were designated for specific sporting activities, one park was hidden deep in a residential neighborhood, and one park actually serves as a part of a school yard during the regular school year.

In our initial evaluation process, the ideal site for a rain garden is an area that will collect and infiltrate stormwater runoff from impervious areas such walkways, parking lots, and heavily impacted grassy areas/lawns. Both Culver City Park and the Ivy Substation have multiple grassy sites adjacent to small impervious surfaces. These impervious areas drain into a nearby catch basin. At both locations, the rain garden would capture a portion of stormwater runoff that typically flows into the nearby catch basin.

Culver City Park is a large, multi level park, which attracts various groups of people because of the many activities it has to offer. At the highest point of the park and the top of a nature trail, there is a view of the City and also of a portion of Ballona Creek. The various patches of grassy areas that we recommend directly overlook the City. This is an ideal location for a demonstration rain garden to educate the community about stormwater runoff, pollution

prevention and their connection to Ballona Creek. The proposed size for this rain garden would be approximately 200 square feet.

The Ivy Substation & Media Park is a centrally located park in the heart of downtown. It has constant foot traffic from the surrounding businesses in the area and also the Ivy Substation. The grassy area directly adjacent to the walkways leading to the entrance of the Ivy Substation provides a potential site for infiltration of runoff from the walkways and could also serve as a demonstration project site in a high traffic area of the City. The current cluster of plants in this area will need to be removed if this site is chosen. The proposed size of this rain garden is approximately 300 square feet.

The majority of parks and areas evaluated had small buildings with slanted rooftops. Syd Kronenthal Park community recreation building and the Culver City Julian Dixon Library both have flat rooftops and existing roof drains. Consequently, our initial evaluation identified them as potential sites where roof downspout disconnects could be routed into underground cisterns to collect water for possible reuse on site. These locations would also serve as great demonstration project sites because of their heavy use and proximity to Ballona Creek.

Syd Kronenthal Park is located adjacent to Ballona Creek and a heavily used bike path at the entrance to the creek. The park offers a variety of sporting activities and a community center which attract many visitors. We propose installing new downspouts along the community center roof (approximately 4800 square feet) that would discharge into an underground cistern located outside the building in a vacant area of approximately 400 square feet. This cistern would need to be sized to collect a portion of the runoff from the roof, with a bypass to direct larger flows to the storm drain system. An extensive irrigation system waters the large, grassy areas located all around the community center. Water from the proposed cistern could be used to supplement this irrigation. In addition, smart controllers and rotating nozzles offered by the Metropolitan Water District will help to prevent over-watering and optimize irrigation in the park. A heavily planted garden located in front of the community center is known as the "Children's Garden." The garden is surrounded entirely by impervious walkways and could potentially serve as location for a rain garden at this site.

The Culver City Julian Library is also located adjacent to Ballona Creek and a heavily used bike path at the entrance to the creek. The Ballona Creek Water Quality Improvement Project site is located next to the library, and Farragut Elementary, Culver City Middle School, and Culver City High School are located directly behind the library. Many students use the bike path and the entrance near the library during the school year. This site could serve as a potential demonstration project site and provide a way to tie various Culver City water quality projects into a larger community education piece.

We propose that a portion of the library's approximately 21,000 square foot roof top be diverted to a rain downspout disconnect. There is a sizeable unpaved area along the side of the library facing Ballona Creek where an underground cistern could be installed. This side of the building also has existing rain downspouts that discharge directly to the ground. These existing downspouts could be redirected to the cistern to capture rain water. In front of the library there is a beautiful Japanese garden and waterwheel. This garden has an existing sprinkler system and is vegetated by local trees, plants and flowers. The water captured in the cistern at this site could be reused to irrigate this extensive garden.

Low Flow Water Brooms

Many businesses throughout the Los Angeles Region regularly hose down the sidewalk or impervious surface areas that surround their businesses, unless an ordinance exists and is strictly enforced. This practice is an easy means to remove debris and trash from their place of business. Nuisance flow or dry weather runoff in many cities usually originates from behaviors such as hosing down sidewalks, car washing, or over watering of lawns. This nuisance flow transports trash and other pollutants and usually ends up in our local waterways.

Another critical and timely environmental issue is water supply. This issue is being addressed by various agencies and is also a key part of many TMDL requirements in the Los Angeles region. A low flow, high pressurized water broom is a very effective and environmentally sound method to address both water quality and water supply issues. It reduces water use by approximately 80 to 95 percent per use.

Initially, we propose determining the number and various categories of businesses that may be hosing off surfaces through informational links such as www.culvercity.org/business/business_type.asp and speaking with the Chamber of Commerce and Downtown Business Association to assure we have the most current list of businesses. Based on that list, we will evaluate the categories of businesses that could benefit most from this program and are most likely to wash down external areas. We propose to interview staff from each business and obtain further guidance from Sustainable Works Business Greening Program, a specific program of Sustainable Works, a non-profit environmental education organization. They have developed strategic ways to approach businesses about "greening" and have developed successful programs to help businesses in the City of Santa Monica reduce waste and become more water efficient. We believe that this low flow water broom program can be the stepping stone to a city wide program and a possible certification or "green seal" program for businesses throughout the City.

Our proposed marketing plan includes initially choosing 800 businesses to receive a letter in the mail about the low flow water broom. The letter would highlight the opportunity to obtain a free low flow water broom, the long term cost savings because of water use reduction, and the benefits of being part of the solution to water issues in our State. In addition, we can offer these businesses marketing ideas on how to use their participation in the program as a selling tool and community support initiative. We estimate a conversion of over 50 percent participation because of the aforementioned benefits to business.

The next step would be to purchase and distribute water brooms to participating businesses. (The stickers and bilingual education materials for the water brooms are discussed below under Public Outreach.) We plan to model the distribution of products and materials and follow up with the businesses after the Sustainable Works program mentioned above. Similar to their program we will reach out to local non-profit groups, the Ballona Creek Watershed Task Force, and local community colleges to recruit volunteers to assist with business outreach and follow up. This will allow us to set the stage for a community based business "greening" program for the City of Culver City. By having more people to spread out over the numerous businesses, we can offer more one-on-one involvement with the businesses and their staff.

In order to effectively monitor and manage this program, we will need to set up a "follow-up" system where we will communicate regularly with the water broom user group. This could be in the form of mass e-mail or direct mail that would require a response from the participants. It should be set up so that it is fast and easy to respond and efficient to evaluate. Phone or on-site follow-up will be conducted as well. Our goal would be to work not only with the owners of businesses, but also directly with staff to encourage use of the brooms and determine any behavior change that positively impacts their community and the environment.

Quality Assurance Project Plan (QAPP), Monitoring Plan (MP) and Project Assessment and Evaluation (PAEP)

The Project Manager proposed for this project has direct experience with project administration of State funding. She has developed multiple QAPPs and MPs and also assisted in the development of QAPPs for monitoring programs for various non-profits in the Los Angeles Region. She is currently the project administrator for a Proposition 50 Clean Beaches Initiative grant for the City of Avalon and has completed the PAEP for this project.

Our goal is to work closely with the City's project manager and also the funding source contract manager to expedite all deliverables. We understand the specific requirements of State funded projects and as a Team have successfully completed numerous projects funded by State or Federal grants.

Trash and Recycling Bins

Initially, we propose to work with and interview public works staff that maintains trash and recycling receptacles to identify all locations and anecdotal data on high-litter areas in the City. We will also evaluate land uses and the average number of receptacles by land use type to determine where new or additional receptacles should be placed. We plan to team up with volunteers from the community to conduct thorough observational monitoring to help accomplish this task and see positive results.

"How To" Manuals

We propose to develop and produce a series of "How To" maintenance manuals for City staff and field crews. It will be important to work directly with the staff and crew to incorporate their input and produce a user-friendly manual. Our firms have extensive experience in developing training manuals for stormwater BMPs, stormwater guidance documents for agencies, and water quality monitoring manuals created for various entities such as agencies and also volunteers from the community.

Public Education

Creative designs and proper placement of interpretive signs will help emphasize BMP installation and the City's efforts in this project. We propose to develop a marketing brand that denotes the City's environmental efforts in this project and for future projects. The City currently uses the theme "The Heart of the Screenland" as an overall marketing brand for the City, and we plan to incorporate this theme with an environmental focus for all aspects of this project.

A critical aspect of this entire program is educating the community about the purpose of this program, how they can play a part in it and, ultimately, what the benefit is to them. In short, the message is that cleaner water and a cleaner environment result in a better overall future for the community. All of these things can provide an incentive for people to take part in these important initiatives. Communicating this information is a significant undertaking which must use all of the communications tools available to us.

Full Capture Catch Basin Interpretive Stencils

The primary goal of this project is to reduce trash and debris pollution at the catch basin level. The project will be more successful if the public is made aware of each of the 672 sites. However, installing a traditional sign adjacent to each catch basin would be costly and ineffective - a more innovative approach must be taken to convey the message to the public.

We propose to apply a creative stencil on all retrofitted catch basins that will educate the public about the full capture insert installed at each of these sites (similar to existing stencils that remind us not to litter because storm drains lead to the ocean). This campaign has instilled a sense of understanding and proactive effort to stop littering. This is an inexpensive and innovative way to highlight the BMPs and the pro-active steps the City is taking to improve water quality. This stencil will depict the new marketing brand created specifically for the City and its environmental projects.

City Parks BMP Interpretive Signs

We propose that the City's rain gardens and associated BMP projects be located close to Ballona Creek. Thus, interpretive signs placed at the sites can make the connection between Ballona Creek and the City's projects to highlight the benefits of these activities on water quality in the creek.

Low Flow, High Pressurized Water Brooms and Trash and Recycling Bins

The stickers created for the water brooms will feature the special marketing brand developed for the City's environmental projects. They will also credit all funding sources responsible for this project. A similar type of design will be used for trash and recycling receptacles, but size and quality may vary. Our goal is to ensure that the community recognizes the environmental initiatives the City is implementing through this project.

Public Relations Materials - Press Releases, Articles, Bilingual Materials and Brochures

Once the initial branding of the program is established, we will create the various components of the marketing and public relations campaign. Elements such as press releases, articles for community publications and brochures for distribution will be developed as needed to communicate, motivate and inspire our target audience. All publications will be produced in English and Spanish so as effectively reach the widest possible audience. Our bi-lingual marketing experts will be able to quickly determine the best way to communicate in both languages during the creation of all materials.

Most efforts of media distribution will concentrate on local media, but project milestones will be distributed to nationwide newspaper outlets as well as local ones.

Addition to City's Website, Including Interactive Kid's Page

We plan to work with the City's IT staff to promote project highlights on the home page of the City's website, in conjunction with press releases. In addition, one or more new webpage(s) will be created to highlight project goals and milestones and serve as a source of information for the community. We hope to use these pages to provide information on BMP construction and monitoring, community outreach for volunteers, and outreach materials available to the public.

We also propose to work with local non-profit groups and schools to develop a better understanding of the types of children's activities are effective for various ages. We plan to develop an animated character that can be used throughout the program to engage our younger audiences. Through the character we will communicate the key aspects of environmental stewardship and emphasize the role of each child in helping to develop a cleaner world and a better future for all. Activities will be downloadable and links to other kid's activities sites will be available as well.

Tours

Our team will organize tours of the various sites to promote the activities, build excitement, and create a "discussion buzz" amongst members of the community. Tours would be advertised to various audiences within the City, such as business owners that participated in the water broom project, teachers from local schools, members of the Ballona Creek Watershed Task Force, staff and officials from the City, other agency and city staff, Regional Board staff and non-profit leaders. A student tour would include an initial classroom presentation, hands on activities such as water quality testing at various BMP sites, and an opportunity to share comments about their experience (e.g., through existing science curriculum; writing contest on their tour experience about how they are connected to the watershed and Ballona Creek). The contest and winner could be featured in an article and/or on the City website.

Presentations

The combination of firms and individuals on our Team have years of experience with presentations at the regional and national level. Each Team member contributes a unique set of skills and experiences that, together, can create an entertaining and informative presentation for all levels and types of audiences.

Our Team proposes to approach each task in this project strategically so that we focus on the importance of the "treatment train" thus producing a more significant reduction in the target pollutants. By understanding the watershed, land uses and researching how day to day behavior and practices affect our storm drain system and water quality, we can approach implementation of BMPs so that each type of BMP has a direct impact on the next one. In addition to measurable pollutant reduction, we plan to achieve measurable community awareness and behavior change towards a healthier environment.

Master Project Schedule

Master Schedule City of Culver's Citywide Stormwater BMP Treatment Train Project

The milestones for this project are represented in the master schedule as different icons to symbolize the achievement of the specific task and associated deliverable(s). We identified the milestones as subtasks that require approval or an agreement to proceed to the next tasks. Also, subtasks that signify transferring responsibility and maintenance of BMPs and interpretive signs are identified as milestones for this project.

To quickly reach consensus between our Team, the City of Culver City and all other agencies and to move all processes in an efficient manner, a content management site will be created on the web. This content management site will be used by all parties involved to easily access and view documents created for and pertain to the project. An associated FTP site will enable all parties to upload large documents and have access to large files that are commonly associated with a project of this caliber. A blog on the site will allow all parties to interact with each other or within their group and within the project tasks. Also a system will be created through this site so that all parties can go through checklists for portions of the projects that need consensus and approvals from the various parties. Image software for uploading and quickly sharing pictures will be available and a web based calendar on the site will allow all parties to track process on the project. This site will be project specific and only authorized users will be able to access it.

We believe that this is the most efficient and cost effective way to move through all parts of this project in a timely manner.



Document
Approval



Installation



Public
Education



City Assumes
Responsibility



Agreement



Presentation

Master Schedule City of Culver's Citywide Stormwater BMP Treatment Train Project

Task and Deliverable		Dec-07	Jan-08	Feb-08	Mar-08	Mar-09
Task 1	Installation, Monitor, Education of Full Capture Catch Basins					
Deliverable	1.1 Research certified full capture catch basin inserts					
	Names of agencies and personnel					
Deliverable	1.2 Select full capture insert for installation in 672 catch basins					
	Matrix of selection criteria					
Deliverable	1.3 Create and submit draft and final design plans, specifications, and installation schedule for full capture inserts					
Deliverable	Draft plans, specifications, and schedule for inserts					
Deliverable	Final plans, specification and schedule for inserts					
Deliverable	1.4 Create and install interpretive signs that explains purpose of project and full capture inserts					
	Draft plans, specifications and schedule for interpretive sign					
Deliverable	Final plans, specifications and schedule for interpretive sign					
Deliverable	1.5 Obtain all necessary permits and agreements with all agencies for full capture inserts					
	Signed and approved permits and agreements					
Deliverable	1.6 Prepare and submit Notice to Proceed with City Manager					
	Notice to Proceed					
Deliverable	1.7 Install chosen full capture catch basin insert					
	672 inserts installed and functioning					
Deliverable	1.8 Install interpretive signs					
	Interpretative signs in place at selected sites					
Deliverable	1.9 Conduct and submit photo documentation of pre, during, and post installation					
	Invoice, gps coordinates, and photo documentation of inserts installation					
Deliverable	1.10 Develop and conduct monitoring activities for full capture inserts					
	Summary and analysis of monitoring results					
Deliverable	1.11 Compile and submit summary report from baseline data of trash captured					
	Baseline trash results summary					
Deliverable	1.12 Develop and implement public education program					
	See Task 7 and Subtask 1.8					
Deliverable	1.13 Develop and submit draft maintenance plan and manual for inserts					
	See Task 5.1					
Deliverable	1.14 Develop and submit draft powerpoint to train City Crew on insert maintenance					
	Draft powerpoint presentation					
Deliverable	Final powerpoint presentation					
Deliverable	Training and sign in sheet					

Master Schedule City of Culver's Citywide Stormwater BMP Treatment Train Project

Task and Deliverables		Oct-07	Nov-07	Dec-07	Jan-08	Feb-08	Mar-08	Mar-09
Task 2	Installation, Monitor, Education of Full Capture Catch Basins							
	2.1 Select City Park for installation of rain garden							
Deliverable	Matrix of selection criteria							
Deliverable	GPS coordinates							
	2.2 Prepare and submit design plans, specification, and installation schedule for rain garden							
Deliverable	Draft plans, specifications, and schedule for rain garden							
Deliverable	Final plans, specification and schedule for rain garden							
	2.3 Prepare and submit design plans, specification, and installation schedule for interpretive sign near rain garden							
Deliverable	Draft plans, specifications and schedule for interpretive sign for rain garden							
Deliverable	Final plans, specifications and schedule for interpretive sign for rain garden							
	2.4 Prepare and submit Notice to Proceed with City Manager							
Deliverable	Notice to Proceed							
	2.5 Install rain garden, storage and conveyance system, and interpretive sign							
Deliverable	Functioning rain garden and interpretive sign in place							
	2.6 Conduct and submit photo documentation of pre, during and post installation							
Deliverable	Invoice, gps coordinates, and photo documentation of rain garden installation							
	2.7 Develop monitoring plan and conduct monitoring activities for rain garden							
Deliverable	See 6.2.1 and 6.2.4							
	2.8 Develop and implement public education program							
Deliverable	See Task 7 and 2.3							
	2.9 Develop and submit draft maintenance plan and manual for rain garden							
Deliverable	See Task 5.2							
Task and Deliverables		Oct-07	Nov-07	Dec-07	Jan-08	Feb-08	Mar-08	Mar-09
	3.1 Select City Park for installation of rain garden, downspout disconnection, and cistern							
Deliverable	Matrix of selection criteria							
Deliverable	GPS coordinates							
	3.2 Prepare and submit design plans, specifications, and installation schedule for rain garden and conveyance system							
Deliverable	Draft design plans, specifications, and schedule for rain garden and storage and conveyance system							
Deliverable	Final design plans, specifications, and schedule for rain garden and storage and conveyance system							

Master Schedule City of Culver's Citywide Stormwater BMP Treatment Train Project

		Mar-09	Mar-08	Feb-08	Jan-08	Dec-07	Nov-07	Oct-07	Sept-07	Aug-07	Jul-07	Jun-07	May-07	Apr-07	Mar-07	Feb-07	Jan-07	Dec-06	Nov-06	Oct-06	Sept-06	Aug-06	Jul-06	Jun-06	May-06	Apr-06	Mar-06	Feb-06	Jan-06	Dec-05	Nov-05	Oct-05	Sept-05	Aug-05	Jul-05	Jun-05	May-05	Apr-05	Mar-05	Feb-05	Jan-05	Dec-04	Nov-04	Oct-04	Sept-04	Aug-04	Jul-04	Jun-04	May-04	Apr-04	Mar-04	Feb-04	Jan-04	Dec-03	Nov-03	Oct-03	Sept-03	Aug-03	Jul-03	Jun-03	May-03	Apr-03	Mar-03	Feb-03	Jan-03	Dec-02	Nov-02	Oct-02	Sept-02	Aug-02	Jul-02	Jun-02	May-02	Apr-02	Mar-02	Feb-02	Jan-02	Dec-01	Nov-01	Oct-01	Sept-01	Aug-01	Jul-01	Jun-01	May-01	Apr-01	Mar-01	Feb-01	Jan-01	Dec-00	Nov-00	Oct-00	Sept-00	Aug-00	Jul-00	Jun-00	May-00	Apr-00	Mar-00	Feb-00	Jan-00	Dec-99	Nov-99	Oct-99	Sept-99	Aug-99	Jul-99	Jun-99	May-99	Apr-99	Mar-99	Feb-99	Jan-99	Dec-98	Nov-98	Oct-98	Sept-98	Aug-98	Jul-98	Jun-98	May-98	Apr-98	Mar-98	Feb-98	Jan-98	Dec-97	Nov-97	Oct-97	Sept-97	Aug-97	Jul-97	Jun-97	May-97	Apr-97	Mar-97	Feb-97	Jan-97	Dec-96	Nov-96	Oct-96	Sept-96	Aug-96	Jul-96	Jun-96	May-96	Apr-96	Mar-96	Feb-96	Jan-96	Dec-95	Nov-95	Oct-95	Sept-95	Aug-95	Jul-95	Jun-95	May-95	Apr-95	Mar-95	Feb-95	Jan-95	Dec-94	Nov-94	Oct-94	Sept-94	Aug-94	Jul-94	Jun-94	May-94	Apr-94	Mar-94	Feb-94	Jan-94	Dec-93	Nov-93	Oct-93	Sept-93	Aug-93	Jul-93	Jun-93	May-93	Apr-93	Mar-93	Feb-93	Jan-93	Dec-92	Nov-92	Oct-92	Sept-92	Aug-92	Jul-92	Jun-92	May-92	Apr-92	Mar-92	Feb-92	Jan-92	Dec-91	Nov-91	Oct-91	Sept-91	Aug-91	Jul-91	Jun-91	May-91	Apr-91	Mar-91	Feb-91	Jan-91	Dec-90	Nov-90	Oct-90	Sept-90	Aug-90	Jul-90	Jun-90	May-90	Apr-90	Mar-90	Feb-90	Jan-90	Dec-89	Nov-89	Oct-89	Sept-89	Aug-89	Jul-89	Jun-89	May-89	Apr-89	Mar-89	Feb-89	Jan-89	Dec-88	Nov-88	Oct-88	Sept-88	Aug-88	Jul-88	Jun-88	May-88	Apr-88	Mar-88	Feb-88	Jan-88	Dec-87	Nov-87	Oct-87	Sept-87	Aug-87	Jul-87	Jun-87	May-87	Apr-87	Mar-87	Feb-87	Jan-87	Dec-86	Nov-86	Oct-86	Sept-86	Aug-86	Jul-86	Jun-86	May-86	Apr-86	Mar-86	Feb-86	Jan-86	Dec-85	Nov-85	Oct-85	Sept-85	Aug-85	Jul-85	Jun-85	May-85	Apr-85	Mar-85	Feb-85	Jan-85	Dec-84	Nov-84	Oct-84	Sept-84	Aug-84	Jul-84	Jun-84	May-84	Apr-84	Mar-84	Feb-84	Jan-84	Dec-83	Nov-83	Oct-83	Sept-83	Aug-83	Jul-83	Jun-83	May-83	Apr-83	Mar-83	Feb-83	Jan-83	Dec-82	Nov-82	Oct-82	Sept-82	Aug-82	Jul-82	Jun-82	May-82	Apr-82	Mar-82	Feb-82	Jan-82	Dec-81	Nov-81	Oct-81	Sept-81	Aug-81	Jul-81	Jun-81	May-81	Apr-81	Mar-81	Feb-81	Jan-81	Dec-80	Nov-80	Oct-80	Sept-80	Aug-80	Jul-80	Jun-80	May-80	Apr-80	Mar-80	Feb-80	Jan-80	Dec-79	Nov-79	Oct-79	Sept-79	Aug-79	Jul-79	Jun-79	May-79	Apr-79	Mar-79	Feb-79	Jan-79	Dec-78	Nov-78	Oct-78	Sept-78	Aug-78	Jul-78	Jun-78	May-78	Apr-78	Mar-78	Feb-78	Jan-78	Dec-77	Nov-77	Oct-77	Sept-77	Aug-77	Jul-77	Jun-77	May-77	Apr-77	Mar-77	Feb-77	Jan-77	Dec-76	Nov-76	Oct-76	Sept-76	Aug-76	Jul-76	Jun-76	May-76	Apr-76	Mar-76	Feb-76	Jan-76	Dec-75	Nov-75	Oct-75	Sept-75	Aug-75	Jul-75	Jun-75	May-75	Apr-75	Mar-75	Feb-75	Jan-75	Dec-74	Nov-74	Oct-74	Sept-74	Aug-74	Jul-74	Jun-74	May-74	Apr-74	Mar-74	Feb-74	Jan-74	Dec-73	Nov-73	Oct-73	Sept-73	Aug-73	Jul-73	Jun-73	May-73	Apr-73	Mar-73	Feb-73	Jan-73	Dec-72	Nov-72	Oct-72	Sept-72	Aug-72	Jul-72	Jun-72	May-72	Apr-72	Mar-72	Feb-72	Jan-72	Dec-71	Nov-71	Oct-71	Sept-71	Aug-71	Jul-71	Jun-71	May-71	Apr-71	Mar-71	Feb-71	Jan-71	Dec-70	Nov-70	Oct-70	Sept-70	Aug-70	Jul-70	Jun-70	May-70	Apr-70	Mar-70	Feb-70	Jan-70	Dec-69	Nov-69	Oct-69	Sept-69	Aug-69	Jul-69	Jun-69	May-69	Apr-69	Mar-69	Feb-69	Jan-69	Dec-68	Nov-68	Oct-68	Sept-68	Aug-68	Jul-68	Jun-68	May-68	Apr-68	Mar-68	Feb-68	Jan-68	Dec-67	Nov-67	Oct-67	Sept-67	Aug-67	Jul-67	Jun-67	May-67	Apr-67	Mar-67	Feb-67	Jan-67	Dec-66	Nov-66	Oct-66	Sept-66	Aug-66	Jul-66	Jun-66	May-66	Apr-66	Mar-66	Feb-66	Jan-66	Dec-65	Nov-65	Oct-65	Sept-65	Aug-65	Jul-65	Jun-65	May-65	Apr-65	Mar-65	Feb-65	Jan-65	Dec-64	Nov-64	Oct-64	Sept-64	Aug-64	Jul-64	Jun-64	May-64	Apr-64	Mar-64	Feb-64	Jan-64	Dec-63	Nov-63	Oct-63	Sept-63	Aug-63	Jul-63	Jun-63	May-63	Apr-63	Mar-63	Feb-63	Jan-63	Dec-62	Nov-62	Oct-62	Sept-62	Aug-62	Jul-62	Jun-62	May-62	Apr-62	Mar-62	Feb-62	Jan-62	Dec-61	Nov-61	Oct-61	Sept-61	Aug-61	Jul-61	Jun-61	May-61	Apr-61	Mar-61	Feb-61	Jan-61	Dec-60	Nov-60	Oct-60	Sept-60	Aug-60	Jul-60	Jun-60	May-60	Apr-60	Mar-60	Feb-60	Jan-60	Dec-59	Nov-59	Oct-59	Sept-59	Aug-59	Jul-59	Jun-59	May-59	Apr-59	Mar-59	Feb-59	Jan-59	Dec-58	Nov-58	Oct-58	Sept-58	Aug-58	Jul-58	Jun-58	May-58	Apr-58	Mar-58	Feb-58	Jan-58	Dec-57	Nov-57	Oct-57	Sept-57	Aug-57	Jul-57	Jun-57	May-57	Apr-57	Mar-57	Feb-57	Jan-57	Dec-56	Nov-56	Oct-56	Sept-56	Aug-56	Jul-56	Jun-56	May-56	Apr-56	Mar-56	Feb-56	Jan-56	Dec-55	Nov-55	Oct-55	Sept-55	Aug-55	Jul-55	Jun-55	May-55	Apr-55	Mar-55	Feb-55	Jan-55	Dec-54	Nov-54	Oct-54	Sept-54	Aug-54	Jul-54	Jun-54	May-54	Apr-54	Mar-54	Feb-54	Jan-54	Dec-53	Nov-53	Oct-53	Sept-53	Aug-53	Jul-53	Jun-53	May-53	Apr-53	Mar-53	Feb-53	Jan-53	Dec-52	Nov-52	Oct-52	Sept-52	Aug-52	Jul-52	Jun-52	May-52	Apr-52	Mar-52	Feb-52	Jan-52	Dec-51	Nov-51	Oct-51	Sept-51	Aug-51	Jul-51	Jun-51	May-51	Apr-51	Mar-51	Feb-51	Jan-51	Dec-50	Nov-50	Oct-50	Sept-50	Aug-50	Jul-50	Jun-50	May-50	Apr-50	Mar-50	Feb-50	Jan-50	Dec-49	Nov-49	Oct-49	Sept-49	Aug-49	Jul-49	Jun-49	May-49	Apr-49	Mar-49	Feb-49	Jan-49	Dec-48	Nov-48	Oct-48	Sept-48	Aug-48	Jul-48	Jun-48	May-48	Apr-48	Mar-48	Feb-48	Jan-48	Dec-47	Nov-47	Oct-47	Sept-47	Aug-47	Jul-47	Jun-47	May-47	Apr-47	Mar-47	Feb-47	Jan-47	Dec-46	Nov-46	Oct-46	Sept-46	Aug-46	Jul-46	Jun-46	May-46	Apr-46	Mar-46	Feb-46	Jan-46	Dec-45	Nov-45	Oct-45	Sept-45	Aug-45	Jul-45	Jun-45	May-45	Apr-45	Mar-45	Feb-45	Jan-45	Dec-44	Nov-44	Oct-44	Sept-44	Aug-44	Jul-44	Jun-44	May-44	Apr-44	Mar-44	Feb-44	Jan-44	Dec-43	Nov-43	Oct-43	Sept-43	Aug-43	Jul-43	Jun-43	May-43	Apr-43	Mar-43	Feb-43	Jan-43	Dec-42	Nov-42	Oct-42	Sept-42	Aug-42	Jul-42	Jun-42	May-42	Apr-42	Mar-42	Feb-42	Jan-42	Dec-41	Nov-41	Oct-41	Sept-41	Aug-41	Jul-41	Jun-41	May-41	Apr-41	Mar-41	Feb-41	Jan-41	Dec-40	Nov-40	Oct-40	Sept-40	Aug-40	Jul-40	Jun-40	May-40	Apr-40	Mar-40	Feb-40	Jan-40	Dec-39	Nov-39	Oct-39	Sept-39	Aug-39	Jul-39	Jun-39	May-39	Apr-39	Mar-39	Feb-39	Jan-39	Dec-38	Nov-38	Oct-38	Sept-38	Aug-38	Jul-38	Jun-38	May-38	Apr-38	Mar-38	Feb-38	Jan-38	Dec-37	Nov-37	Oct-37	Sept-37	Aug-37	Jul-37	Jun-37	May-37	Apr-37	Mar-37	Feb-37	Jan-37	Dec-36	Nov-36	Oct-36	Sept-36	Aug-36	Jul-36	Jun-36	May-36	Apr-36	Mar-36	Feb-36	Jan-36	Dec-35	Nov-35	Oct-35	Sept-35	Aug-35	Jul-35	Jun-35	May-35	Apr-35	Mar-35	Feb-35	Jan-35	Dec-34	Nov-34	Oct-34	Sept-34	Aug-34	Jul-34	Jun-34	May-34	Apr-34	Mar-34	Feb-34	Jan-34	Dec-33	Nov-33	Oct-33	Sept-33	Aug-33	Jul-33	Jun-33	May-33	Apr-33	Mar-33	Feb-33	Jan-33	Dec-32	Nov-32	Oct-32	Sept-32	Aug-32	Jul-32	Jun-32	May-32	Apr-32	Mar-32	Feb-32	Jan-32	Dec-31	Nov-31	Oct-31	Sept-31	Aug-31	Jul-31	Jun-31	May-31	Apr-31	Mar-31	Feb-31	Jan-31	Dec-30	Nov-30	Oct-30	Sept-30	Aug-30	Jul-30	Jun-30	May-30	Apr-30	Mar-30	Feb-30	Jan-30	Dec-29	Nov-29	Oct-29	Sept-29	Aug-29	Jul-29	Jun-29	May-29	Apr-29	Mar-29	Feb-29	Jan-29	Dec-28	Nov-28	Oct-28	Sept-28	Aug-28	Jul-28	Jun-28	May-28	Apr-28	Mar-28	Feb-28	Jan-28	Dec-27	Nov-27	Oct-27	Sept-27	Aug-27	Jul-27	Jun-27	May-27	Apr-27	Mar-27	Feb-27	Jan-27	Dec-26	Nov-26	Oct-26	Sept-26	Aug-26	Jul-26	Jun-26	May-26	Apr-26	Mar-26	Feb-26	Jan-26	Dec-25	Nov-25	Oct-25	Sept-25	Aug-25	Jul-25	Jun-25	May-25	Apr-25	Mar-25	Feb-25	Jan-25	Dec-24	Nov-24	Oct-24	Sept-24	Aug-24	Jul-24	Jun-24	May-24	Apr-24	Mar-24	Feb-24	Jan-24	Dec-23	Nov-23	Oct-23	Sept-23	Aug-23	Jul-23	Jun-23	May-23	Apr-23	Mar-23	Feb-23	Jan-23	Dec-22	Nov-22	Oct-22	Sept-22	Aug-22	Jul-22	Jun-22	May-22	Apr-22	Mar-22	Feb-22	Jan-22	Dec-21	Nov-21	Oct-21	Sept-21	Aug-21	Jul-21	Jun-21	May-21	Apr-21	Mar-21	Feb-21	Jan-21	Dec-20	Nov-20	Oct-20	Sept-20	Aug-20	Jul-20	Jun-20	May-20	Apr-20	Mar-20	Feb-20	Jan-20	Dec-19	Nov-19	Oct-19	Sept-19	Aug-19	Jul-19	Jun-19	May-19	Apr-19	Mar-19	Feb-19	Jan-19	Dec-18	Nov-18	Oct-18	Sept-18	Aug-18	Jul-18	Jun-18	May-18	Apr-18	Mar-18	Feb-18	Jan-18	Dec-17	Nov-17	Oct-17	Sept-17	Aug-17	Jul-17	Jun-17	May-17	Apr-17	Mar-17	Feb-17	Jan-17	Dec-16	Nov-16	Oct-16	Sept-16	Aug-16	Jul-16	Jun-16	May-16	Apr-16	Mar-16	Feb-16	Jan-16	Dec-15	Nov-15	Oct-15	Sept-15	Aug-15	Jul-15	Jun-15	May-15	Apr-15	Mar-15	Feb-15	Jan-15	Dec-14	Nov-14	Oct-14	Sept-14	Aug-14	Jul-14	Jun-14	May-14	Apr-14	Mar-14	Feb-14	Jan-14	Dec-13	Nov-13	Oct-13	Sept-13	Aug-13	Jul-13	Jun-13	May-13	Apr-13	Mar-13	Feb-13	Jan-13	Dec-12	Nov-12	Oct-12	Sept-12	Aug-12	Jul-12	Jun-12	May-12	Apr-12	Mar-12	Feb-12	Jan-12	Dec-11	Nov-11	Oct-11	Sept-11	Aug-11	Jul-11	Jun-11	May-11	Apr-11	Mar-11	Feb-11	Jan-11	Dec-10	Nov-10	Oct-10	Sept-10	Aug-10	Jul-10	Jun-10	May-10	Apr-10	Mar-10	Feb-10	Jan-10	Dec-09	Nov-09	Oct-09	Sept-09	Aug-09	Jul-09	Jun-09	May-09	Apr-09	Mar-09	Feb-09	Jan-09	Dec-08	Nov-08	Oct-08	Sept-08	Aug-08	Jul-08	Jun-08	May-08	Apr-08	Mar-08	Feb-08	Jan-08	Dec-07	Nov-07	Oct-07	Sept-07	Aug-07	Jul-07	Jun-07	May-07	Apr-07	Mar-07	Feb-07	Jan-07	Dec-06	Nov-06	Oct-06	Sept-06	Aug-06	Jul-06	Jun-06	May-06	Apr-06	Mar-06	Feb-06	Jan-06	Dec-05	Nov-05	Oct-05	Sept-05	Aug-05	Jul-05	Jun-05	May-05	Apr-05	Mar-05	Feb-05	Jan-05	Dec-04	Nov-04	Oct-04	Sept-04	Aug-04	Jul-04	Jun-04	May-04	Apr-04	Mar-04	Feb-04	Jan-04	Dec-03	Nov-03	Oct-03	Sept-03	Aug-03	Jul-03	Jun-03	May-03	Apr-03	Mar-03	Feb-03	Jan-03	Dec-02	Nov-02	Oct-02	Sept-02	Aug-02	Jul-02	Jun-02	May-02	Apr-02	Mar-02	Feb-02	Jan-02	Dec-01	Nov-01	Oct-01	Sept-01	Aug-01	Jul-01	Jun-01	May-01	Apr-01	Mar-01	Feb-01	Jan-01	Dec-00	Nov-00	Oct-00	Sept-00	Aug-00	Jul-00	Jun-00	May-00	Apr-00	Mar-00	Feb-00	Jan-00	Dec-99	Nov-99	Oct-99	Sept-99	Aug-99	Jul-99	Jun-99	May-99	Apr-99	Mar-99	Feb-99	Jan-99	Dec-98	Nov-98	Oct-98	Sept-98	Aug-98	Jul-98	Jun-98	May-98	Apr-98	Mar-98	Feb-98	Jan-98	Dec-97	Nov-97	Oct-97	Sept-97	Aug-97	Jul-97	Jun-97	May-97	Apr-97	Mar-97	Feb-97	Jan-97	Dec-96	Nov-96	Oct-96	Sept-96	Aug-96	Jul-96	Jun-96	May-96	Apr-96	Mar-96	Feb-96	Jan-96	Dec-95	Nov-95	Oct-95	Sept-95	Aug-95	Jul-95	Jun-95	May-95	Apr-95	Mar-95	Feb-95	Jan-95	Dec-94	
--	--	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--

Master Schedule City of Culver's Citywide Stormwater BMP Treatment Train Project

Task 4		Oct-07	Nov-07	Dec-07	Jan-08	Feb-08	Mar-08	Mar-09
Task and Deliverables								
Deliverable	4.2	Select and submit a minimum of 500 businesses						
		Contact information and gps coordinates						
	4.3	Research the purchase of water brooms and rebates available						
		Evaluation matrix						
	4.4	Design stickers for water brooms that acknowledge the funding source						
		Draft sticker design						
		Final sticker design						
		Digital photo of sticker on broom						
		Contact list of selected businesses						
	4.5	Prepare and submit draft bilingual educational materials						
Deliverable		Draft bilingual materials						
Deliverable		Final bilingual materials						
Deliverable		Contact list of businesses receiving materials						
	4.6	Conduct at a minimum one follow up meeting with businesses to ensure proper usage of brooms						
	Deliverable	Education materials disseminated						
	Deliverable	Checklist and feedback from businesses						
Task and Deliverables		Oct-07	Nov-07	Dec-07	Jan-08	Feb-08	Mar-08	Mar-09
Task 5								
Deliverable	5.1	Develop and submit draft maintenance plan and manual for full capture inserts and associated interpretive signs						
		Draft maintenance plan and manual						
		Final maintenance plan and manual						
	5.2	Develop and submit draft maintenance plan and manual for rain gardens, roof downspout disconnect, cistern, and associated interpretive signs						
		Draft maintenance plan and manual						
		Final maintenance plan and manual						
	5.3	Develop and submit draft maintenance plan and manual for optimized irrigation system and associated interpretive signs						
		Draft maintenance plan and manual						
		Final maintenance plan and manual						

Master Schedule City of Culver's Citywide Stormwater BMP Treatment Train Project

Task	Task Description	Oct-07	Nov-07	Dec-07	Jan-08	Feb-08	Mar-08	Mar-09
Task 7								
Task 7.4								
Deliverable	Install interpretive signs on or near BMP sites							
Deliverable	Full capture insert interpretive sign							
Deliverable	Rain garden demo sites interpretive sign							
Deliverable	Trash and recycling bins stickers or stenciling							
Deliverable	Optimized irrigation signs							
Deliverable	Water broom sticker							
Task 7.5								
Deliverable	Prepare and submit written BMP tour concepts and approach for marketing tours							
Deliverable	Draft BMP tour and marketing concepts							
Deliverable	Final BMP tour and marketing concepts							
Task 7.6								
	Conduct at a minimum, one tour for students and two for general public							
	Information on tour participants							
	Photos of tours							
Task 7.7								
Deliverable	Prepare and submit a draft powerpoint of project for regional and national conferences							
Deliverable	Draft powerpoint presentation							
Deliverable	Final powerpoint presentation							
Task 8								
Task 8								
Deliverable	GPS coordinates for trash and recycling receptacle location							
Deliverable	GPS coordinates of chosen locations							
Deliverable	Color coded map							
Deliverable	Electronic versions of gps coordinates and map							
Task 9								
Task 9								
Deliverable	Draft and Final Project Reports							
Deliverable	9.1 Prepare and submit draft report							
Deliverable	Draft project report							
Deliverable	9.2 Prepare and submit draft report							
Deliverable	Final project report							
Task 10								
Task 10								
Deliverable	Completed NRPI form							

Addendum to Proposal Submitted by Hydrophix for City of Culver's Citywide BMP Treatment Train Project

Full Capture and Trash and Debris Capture Systems

We plan to approach BMP selection for this project by conducting extensive research and data analysis of existing project sites that have installed "full capture systems" and other types of trash and debris capture systems. In addition to the extensive research, we will provide a matrix to aide in the selection process of systems, design and install systems in 672 catch basins owned by the City of Culver City, and design and install interpretive signs for these devices throughout the City.

The Los Angeles Regional Water Quality Control Board (Regional Board) adopted the definition of "Full Capture System" in March 2004. This definition is applicable to all receiving waters in the Los Angeles Region identified as being impaired for Trash. Ballona Creek is identified as impaired for trash and also has an adopted TMDL for trash.

To date, five agencies or groups of agencies have submitted and been certified to implement a specific "Full Capture System." The determination and certification of the specific BMP means that it meets the Regional Boards definition of a "full capture system" for the trash TMDL and will allow the system to be used elsewhere in the region. Approval of the systems in new locations is based on the removal efficiency of the target pollutants and monitoring data on the installed systems.

For this portion of the project, it is also important to understand the watershed of interest and the various land uses within the watershed. Each land use will not only contribute different amounts of trash and debris, but also a variety of types (plastic, paper, leaves, sediment, etc.) that can affect each catch basin and certified system differently. To get a better idea of the types of trash that affect the various catch basins in the City of Culver City, we plan to meet with and conduct field visits with the City's public works field crews to get a better idea of what they encounter and see on a daily basis in the catch basins throughout the City. Their anecdotal information and trash collection data are a significant part of the selection criteria. In addition, input from Regional Board staff that are directly involved with the certification process of "full capture systems" and also familiar with the other systems in the region will be another critical component in the selection process.

Los Angeles County of Public Works (LADPW) has conducted pilot trash BMP projects in the Ballona Creek Watershed and within selected project catch basins owned by LADPW. To conduct work on and properly access catch basins that are owned by the County, various permits and agreements will have to be completed. We consider this one of the significant milestones for the project, for without the proper documentation the project cannot move forward. Both firms have individuals involved in this project that have long standing relationships with key managers at the LADPW and their staff.

In order to legally work on any county-owned catch basins or county-owned land areas, Culver City will need to insure that the appropriate agreements and approvals are in place prior to starting the project. Based on our experience, the following permits will need to be completed:

- 1) Encroachment Permit to access any County owned property
- 2) Connection Permit if any work will be done upstream of any County owned facility which in this case can be the storm drain system and Ballona Creek
- 3) Construction Permit to construct or alter any part of a County owned system.

To select the appropriate trash and debris capture systems, the project team will research devices in use in Los Angeles County. Considerations for selection many include (but are not limited to) ease of design and construction, suitability for retrofit in an existing storm drainage system, capital cost, operations and maintenance requirements, demonstrated pollutant removal effectiveness, longevity, and ease of monitoring. Base on the selected criteria, the project team will develop a selection matrix that will enable us to compare the alternative devices and select one or more that best meet the objectives of the project. Although it is possible that one selected device could function effectively at all 672 locations, the Team is open to considering more than one option.

Water Conservation and Nuisance Flow Elimination BMPs Program

Optimized Irrigation at City Parks and Recreation Centers

Throughout California, residents, business owners, and municipalities and agencies are being encouraged to install water saving improvements to help with our current and ongoing water supply issues.

We propose to research and help implement actions that the City of Culver City can take to replace existing equipment with more efficient equipment in their City parks, therefore resulting in reduced water demand throughout the City.

We will identify nine parks or recreation centers that will benefit the most from installation of optimized irrigation systems. We will assist the City in finding the best types of products available and conduct photo documentation of the installation process for all sites. After installation we will help to monitor and report on improvements in water use at these locations. All available rebates and incentives through local water districts will be researched and used to help the City get the most for their money and efforts.

Low Flow Water Brooms

Many businesses throughout the Los Angeles Region regularly hose down the sidewalk or impervious surface areas that surround their businesses, unless an ordinance exists and is strictly enforced. This practice is an easy means to remove debris and trash from their

place of business. Nuisance flow or dry weather runoff in many cities usually originates from behaviors such as hosing down sidewalks, car washing, or over watering of lawns. This nuisance flow transports trash and other pollutants and usually ends up in our local waterways.

Another critical and timely environmental issue is water supply. This issue is being addressed by various agencies and is also a key part of many TMDL requirements in the Los Angeles region. A low flow, high pressurized water broom is a very effective and environmentally sound method to address both water quality and water supply issues. It reduces water use by approximately 80 to 95 percent per use.

Initially, we propose determining the number and various categories of businesses that may be hosing off surfaces through informational links such as www.culvercity.org/business/business_type.asp and speaking with the Chamber of Commerce and Downtown Business Association to assure we have the most current list of businesses. Based on that list, we will evaluate the categories of businesses that could benefit most from this program and are most likely to wash down external areas. We propose to interview staff from each business and obtain further guidance from Sustainable Works Business Greening Program, a specific program of Sustainable Works, a non-profit environmental education organization. They have developed strategic ways to approach businesses about “greening” and have developed successful programs to help businesses in the City of Santa Monica reduce waste and become more water efficient. We believe that this low flow water broom program can be the stepping stone to a city wide program and a possible certification or “green seal” program for businesses throughout the City.

Our proposed marketing plan includes initially choosing 800 businesses to receive a letter in the mail about the low flow water broom. The letter would highlight the opportunity to obtain a free low flow water broom, the long term cost savings because of water use reduction, and the benefits of being part of the solution to water issues in our State. In addition, we can offer these businesses marketing ideas on how to use their participation in the program as a selling tool and community support initiative. We estimate a conversion of over 50 percent participation because of the aforementioned benefits to business.

The next step would be to purchase and distribute water brooms to participating businesses. (The stickers and bilingual education materials for the water brooms are discussed below under Public Outreach.) We plan to model the distribution of products and materials and follow up with the businesses after the Sustainable Works program mentioned above. Similar to their program we will reach out to local non-profit groups, the Ballona Creek Watershed Task Force, and local community colleges to recruit volunteers to assist with business outreach and follow up. This will allow us to set the stage for a community based business “greening” program for the City of Culver City. By having more people to spread out over the numerous businesses, we can offer more one-on-one involvement with the businesses and their staff.

In order to effectively monitor and manage this program, we will need to set up a “follow-up” system where we will communicate regularly with the water broom user group. This could be in the form of mass e-mail or direct mail that would require a response from the participants. It should be set up so that it is fast and easy to respond and efficient to evaluate. Phone or on-site follow-up will be conducted as well. Our goal would be to work not only with the owners of businesses, but also directly with staff to encourage use of the brooms and determine any behavior change that positively impacts their community and the environment.

Addendum to Proposal Budget Submitted by Hydrophix for City of Culver’s Citywide BMP Treatment Train Project

Contractor Operating Costs Include:
Laboratory and Analysis Costs, Printing, Interpretive Signs, Training and Presentation Materials, Catch Basin Inserts, Water Brooms, Educational Materials, Rain Garden Supplies, Roof Drain Disconnects

Contractor Equipment Costs Include:
Cistern, Equipment Rental for Construction, Optimized Irrigation System

Task 1	Installation, Monitor, Education of Trash Capture Systems				
		\$195,375	\$185,000	\$5,000	\$385,375
	1.1	Research certified full capture catch basin inserts			
	1.2	Select full capture insert for installation in 672 catch basins			
	1.3	Create and submit draft and final design plans, specs, and installation schedule for systems			
	1.4	Create and install interpretive signs that explains purpose of project and full capture inserts			
	1.5	Obtain all necessary permits and agreements with all agencies for full capture inserts			
	1.6	Prepare and submit Notice to Proceed with City Manager			
	1.7	Install chosen full capture catch basin insert			
	1.8	Install interpretive signs			
	1.9	Conduct and submit photo documentation of pre, during, and post installation			
	1.1	Develop and conduct monitoring activities for full capture inserts			
	1.11	Compile and submit summary report from baseline data of trash captured			
	1.12	Develop and implement public education program			
	1.13	Develop and submit draft maintenance plan and manual for inserts			
1.14	Develop and submit draft powerpoint to train City Crew on insert maintenance				
Task 2	Installation, Monitor, and Education of City Parks BMP-Part I				
		\$130,000	\$25,500	\$20,000	\$176,500
	2.1	Select City Park for installation of rain garden			
	2.2	Prepare and submit design plans, specifications, and installation schedule for rain garden			
	2.3	Prepare and submit design plans, specifications, and installation schedule for interpretive sign near rain garden			
	2.4	Prepare and submit Notice to Proceed with City Manager			
	2.5	Install rain garden, storage and conveyance system, and interpretive sign			
	2.6	Conduct and submit photo documentation of pre, during, and post installation			
	2.7	Develop monitoring plan and conduct monitoring activities for rain garden			
	2.8	Develop and implement public education program			
2.9	Develop and submit draft maintenance plan and manual for rain garden				
Task 3	Installation, Monitor, and Education of City Parks BMP-Part II				
		\$219,375	\$34,000	\$15,000	\$269,375
	3.1	Select City Park for installation of rain garden, downspout disconnection, and cistern			
	3.2	Prepare and submit design plans, specifications, and installation schedule for rain garden and conveyance system			
	3.3	Prepare and submit design plans, specifications, and installation schedule for downspout disconnection and underground cistern for possible re-use			
	3.4	Prepare and submit design plans, specifications, and installation schedule for interpretive sign for all components of this task.			
	3.5	Prepare and submit Notice to Proceed with City Manager			
	3.6	Install rain gardens, storage and conveyance system, downspout disconnection, cistern, and interpretive sign			
	3.7	Conduct and submit photo documentation of pre, during, and post installation			
	3.8	Develop monitoring plan and conduct monitoring activities			
	3.9	Develop and implement public education program			
	3.1	Develop and submit draft maintenance plan and manual for rain garden			
3.11	Develop and submit draft powerpoint to train City Park and Rec Staff on maintenance activities associated with rain garden, cistern and downspout disconnection				
Task 4	Low-Flow, High pressurized water brooms				
		\$69,500	\$60,300	\$800	\$130,600
	4.1	Establish a marketing plan for distribution and use of water brooms			
	4.2	Select and submit a minimum of 500 businesses			
	4.3	Research the purchase of water brooms and rebates available			
	4.4	Design stickers for water brooms that acknowledge the funding source			
	4.5	Prepare and submit draft bilingual educational materials			
4.6	Conduct at a minimum one follow up meeting with businesses to ensure proper usage of brooms				
Task 5	Project maintenance-Plans and Manuals ("How-to" guides)				
		\$30,500	\$2,000		\$32,500
	5.1	Develop and submit draft maintenance plan and manual for full capture inserts and associated interpretive signs			
	5.2	Develop and submit draft maintenance plan and manual for rain gardens, roof downspout disconnect, cistern, and associated interpretive signs			
5.3	Develop and submit draft maintenance plan and manual for optimized irrigation system and associated interpretive signs				
Task 6	Project Assessment and Evaluation				
		\$15,000			\$15,000
	6.1	Project Assessment and Evaluation Plan (PAEP)			
	6.1.1	Develop and submit PAEP			
	6.1.2	Implement the approved PAEP			
	6.2	Monitoring Plan (MP) and Quality Assurance Project Plan (QAPP)			
	6.2.1	Develop and submit MP			
	6.2.2	Develop and submit QAPP			
	6.2.3	Implement the approved MP and QAPP			
	6.2.4	Submit for review summary of water quality and other monitoring results from all tasks			
Task 7	Public Outreach				
		\$53,250	\$6,000	\$100	\$59,350
	7.1	Prepare and submit draft press releases			
	7.2	Prepare and submit written concepts for BMP project on City's website			
	7.3	Prepare and submit articles highlighting project for City publications			

22

Addendum to Proposal Budget Submitted by Hydrophix for City of Culver’s Citywide BMP Treatment Train Project

Contractor Operating Costs Include:
Laboratory and Analysis Costs, Printing, Interpretive Signs, Training and Presentation Materials, Catch Basin Inserts, Water Brooms, Educational Materials, Rain Garden Supplies, Roof Drain Disconnects

Contractor Equipment Costs Include:
Cistern, Equipment Rental for Construction, Optimized Irrigation System

	7.4	Install interpretive signs on or near BMP sites			
	7.5	Prepare and submit written BMP tour concepts and approach for marketing tours			
	7.6	Conduct at a minimum, one tour for students and two for general public			
	7.7	Prepare and submit a draft powerpoint of project for regional and national conferences			
Task 8		GPS coordinates for trash and recycling receptacle locations	\$3,000	\$100	\$3,100
Task 9		Draft and Final Project Reports	\$20,500		\$20,500
	9.1	Prepare and submit draft report			
	9.2	Prepare and submit final report			
Task 10		Complete a National Resource Project Inventory Form (NRPI)	\$300		\$300
			\$736,800	\$312,800	\$35,000
				\$8,000	\$1,092,600

Task 1					
Task 2					
Task 3					
Task 4	\$60,000	(Optimized Irrigation Equipment and Install)			
Task 5					
Task 6					
Task 7					
Task 8	\$100,000	(Trash and Recycling Receptacles)			
Task 9					
Task 10					
			\$160,000		