
APPENDIX B

PUBLIC INVOLVEMENT MATERIALS



City of Memphis
Division of Engineering

Stormwater Master Plan for Southland Basin

The purpose of the Master Plan is to identify potential solutions for flooding and drainage issues

Neighborhood Meeting

Meeting Goals

- ❖ Provide information about the project
- ❖ Gather input about drainage and flooding problems you experience

See Map on back for Study Area.

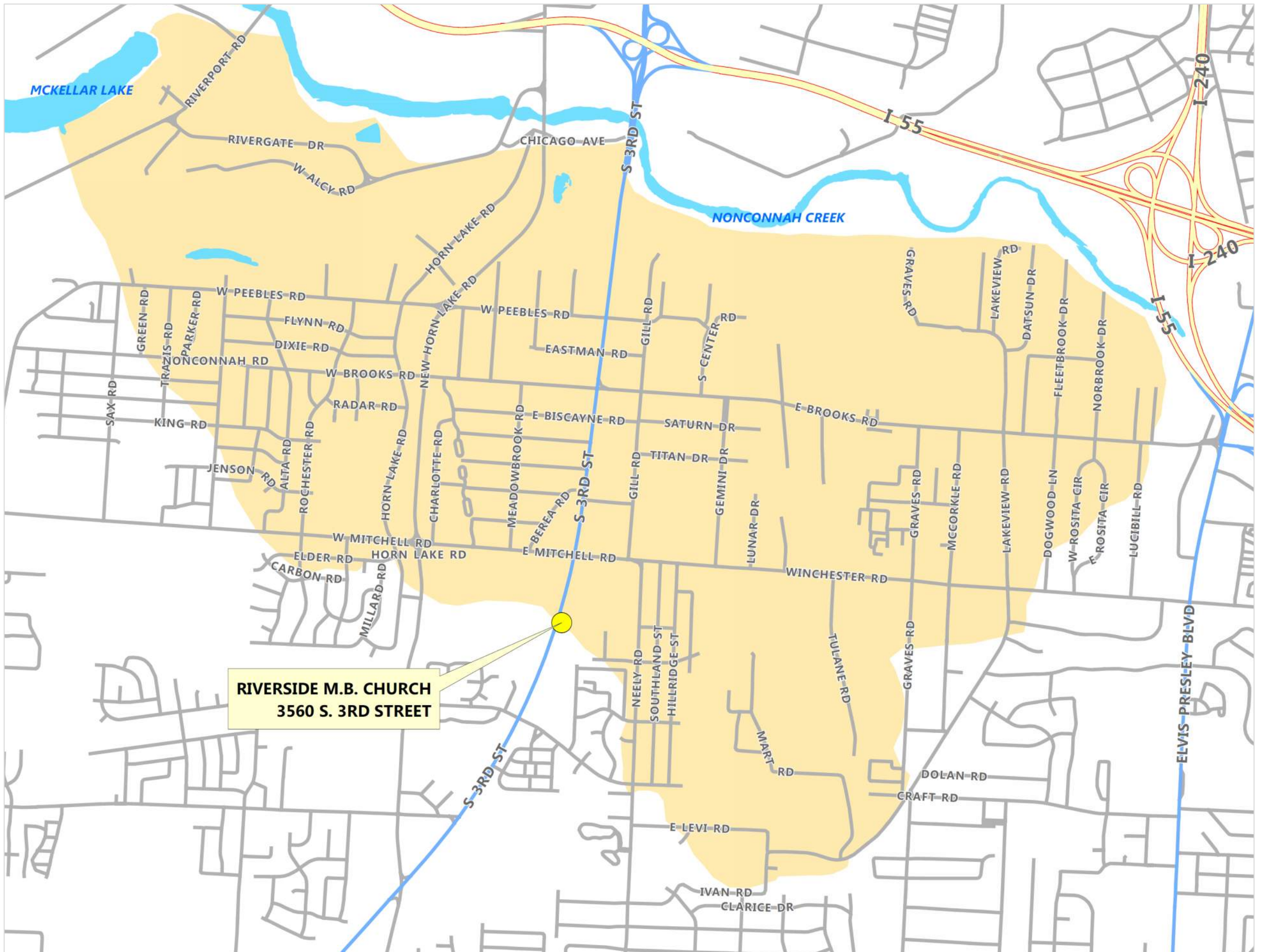
Meeting Time

Thursday, April 28, 2016
6:00 - 8:00 pm

Meeting Location

Riverside M. B. Church
3560 S Third Street
Memphis, TN 38109

Map of Study Area & Meeting Location





City of Memphis
Division of Engineering

STORMWATER MASTER PLAN

SOUTHLAND BASIN

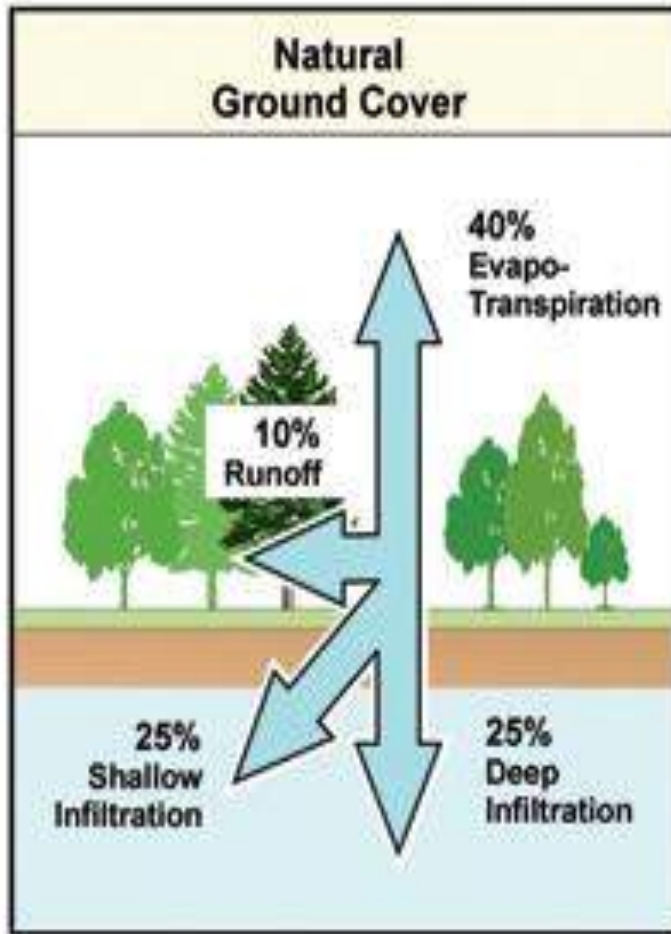
April 28, 2016

Welcome & Introductions

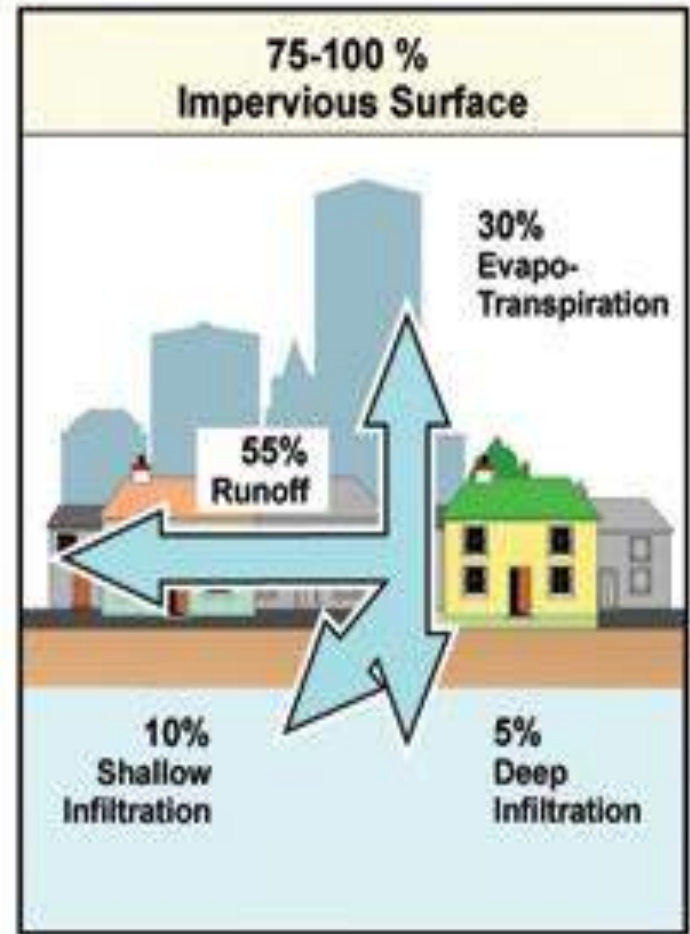
- City of Memphis
- Consultants

Stormwater

How did we get here?



Then – Rural / Natural



Now - Urbanization

Project Background

What are possible effects of stormwater?

- Flooding
- Economic - impacts on roads, bridges, farms, houses, etc.
- Environmental – contamination of streams, rivers, etc.
- Public safety

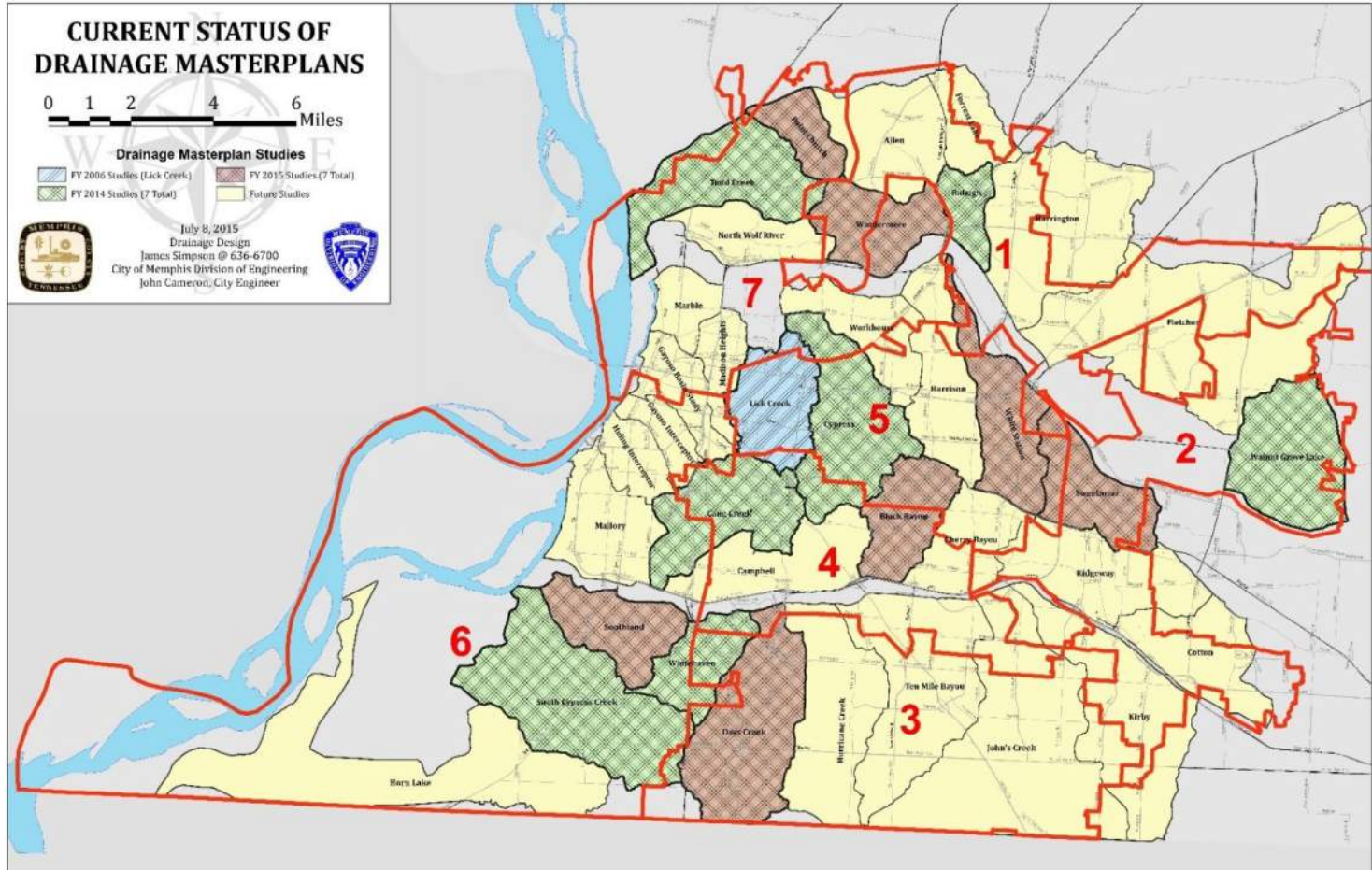
Project Background

What are possible effects of stormwater?



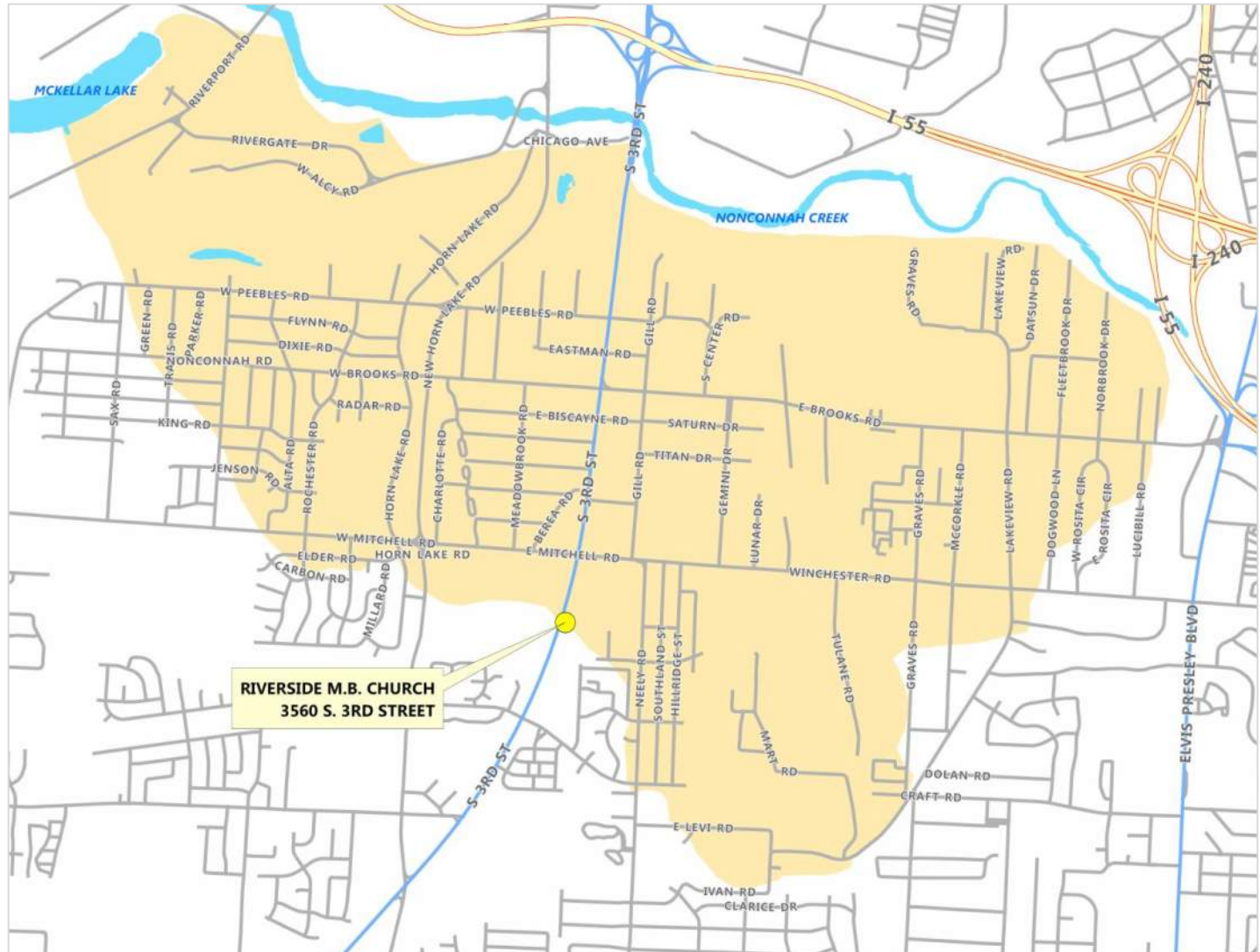
Project Background

Overall City Map



Project Background

Study Area - Southland Basin



Project Background

Your neighborhood – Complaints

NP to Insert Map Here

Project Goals

How do we improve?

Short-term (1 year):

- Survey existing conditions
- Model existing conditions
- Identify possible ways to improve
- Use model to see how it works

Future (2-10 years):

- Prioritize projects
- Implement projects

Survey Existing Conditions



2014.05.27 03:15

Survey Existing Conditions

Your neighborhood – Pics

Southwest of E Mitchell Rd. and S 3rd St.



Southwest of Winchester Rd. and Tulane Rd.



Between W and E Rosita Circle, half way between E Brooks Rd. and Winchester Rd.



Survey Existing Conditions

Your neighborhood – Pics



**South of the CN railyard, north of W
Pebbles Dr. and Green Rd.**



**Lakeview Rd. about 800 feet north of
Winchester Rd.**



Survey Existing Conditions

Your neighborhood – Pics



Just north of E Brooks Rd between
Norbrook Dr. and Fleetbrook Dr.



Lakeview Rd. about 800 feet north of Winchester Rd.



Survey Existing Conditions

Your neighborhood – Pics

Near railroad tracks southwest of E Brooks Rd and. Tranquility Dr.



Crossing under W Rosita Circle south of E Brooks Rd.



Model Existing Conditions

- ArcGIS -based
- InfoSWMM (Stormwater Mgmt Model)
- All consultants required to use same software

Identify Ways to Improve

Short-term - Maintenance issues



Long-term

- Prioritize projects based on criteria such as:
 - Cost
 - Impact of improvement to residents
 - Location of possible improvements
- Implement projects

Please note that residents can call Public Works Drain Maintenance when there are concerns of blocked drains

Your Input

How can you help?

Be involved by:

Tonight

- Signing in – provide email address
- Completing Questionnaire - handouts
- Visiting Map Stations – note problems areas

Future

- Website – www.southlandstormwater.com
- Spread the word

Next Steps

- Gather your input
- Complete survey, model, report
- Provide update to you



City of Memphis - Stormwater Master Plan

Neighborhood Meeting for the Southland Basin
Thursday, April 28, 2016

Sign In Sheet

| | Name | Email Address | Address | Phone Number |
|----|------------------|---------------------|-------------------|---------------------|
| 1 | Mildred Mitchell | mildred48@yahoo.com | 715 Nonconnah Rd | 901 785-0987 |
| 2 | Bessie L. Smith | NA | 783 Flynn Rd. | 785-6913 |
| 3 | Sara Helmy Hare | | 256 W. Brooks Rd. | 901 789-3057 |
| 4 | Carolyn Scott | | 3349 Kalamius Rd. | (901) 262-5329 |
| 5 | Debra Muhammad | | 873 Vanace | Memphis TN 901-2009 |
| 6 | Eva Strong | | 521 Gilleas Rd. | Mem. TN, 785-7886 |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |
| 10 | | | | |



City of Memphis – Stormwater Master Plan

Neighborhood Meeting for Southland Basin

April 28, 2016

QUESTIONNAIRE

The purpose of this Questionnaire is to gather input from you on the flooding and/or drainage conditions in your neighborhood. Please return completed Questionnaires to the Sign-In Desk or mail to the address on the back. **Contact information MUST be provided.**

1. Do you live within the Study Area? Yes ___ No Not Sure ___ (Please ask our team)
2. Do you own property within the Study Area? Yes ___ No Not Sure ___
3. Your property is: A home A business ___ Other _____
4. Do you own or rent your home? Own Rent ___
5. What flooding problems have you experienced around or near your property?

| Type of Flooding | How Deep | How Often | Date of Last Occurrence |
|---|-------------------|-----------|-------------------------|
| <input checked="" type="checkbox"/> Street Flooding | <i>Don't Know</i> | _____ | <i>2011</i> |
| <input type="checkbox"/> Yard Flooding | _____ | _____ | _____ |
| <input type="checkbox"/> Garage Flooding | _____ | _____ | _____ |
| <input type="checkbox"/> Basement Flooding | _____ | _____ | _____ |
| <input type="checkbox"/> Main Building Flooding | _____ | _____ | _____ |

6. Have you ever had property damage (basement, cars, furniture, etc.)? Yes ___ No

If so, describe: _____

7. Do you have documentation of the flooding (high water marks, photos, videos)? Yes ___ No ___

If so, describe: _____

8. May we contact you to discuss further? Yes No ___

(Please see back for additional information.)



City of Memphis – Stormwater Master Plan

Neighborhood Meeting for Southland Basin

April 28, 2016

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2. Do you own property within the Study Area? Yes No Not Sure
3. Your property is: A home A business Other _____
4. Do you own or rent your home? Own Rent
5. What flooding problems have you experienced around or near your property?

| <u>Type of Flooding</u> | <u>How Deep</u> | <u>How Often</u> | <u>Date of Last Occurrence</u> |
|---|-----------------|------------------|--------------------------------|
| <input type="checkbox"/> Street Flooding | _____ | _____ | _____ |
| <input type="checkbox"/> Yard Flooding | _____ | _____ | _____ |
| <input type="checkbox"/> Garage Flooding | _____ | _____ | _____ |
| <input type="checkbox"/> Basement Flooding | _____ | _____ | _____ |
| <input type="checkbox"/> Main Building Flooding | _____ | _____ | _____ |

6. Have you ever had property damage (basement, cars, furniture, etc.)? Yes No

If so, describe: _____

7. Do you have documentation of the flooding (high water marks, photos, videos)? Yes No

If so, describe: _____

8. May we contact you to discuss further? Yes No

(Please see back for additional information.)



City of Memphis – Stormwater Master Plan

Neighborhood Meeting for Southland Basin

April 28, 2016

QUESTIONNAIRE

The purpose of this Questionnaire is to gather input from you on the flooding and/or drainage conditions in your neighborhood. Please return completed Questionnaires to the Sign-In Desk or mail to the address on the back. **Contact information MUST be provided.**

1. Do you live within the Study Area? Yes No Not Sure (Please ask our team)
2. Do you own property within the Study Area? Yes No Not Sure
3. Your property is: A home A business Other
4. Do you own or rent your home? Own Rent
5. What flooding problems have you experienced around or near your property?

| <u>Type of Flooding</u> | <u>How Deep</u> | <u>How Often</u> | <u>Date of Last Occurrence</u> |
|---|-----------------|------------------|--------------------------------|
| <input type="checkbox"/> Street Flooding | _____ | _____ | _____ |
| <input type="checkbox"/> Yard Flooding | _____ | _____ | _____ |
| <input type="checkbox"/> Garage Flooding | _____ | _____ | _____ |
| <input type="checkbox"/> Basement Flooding | _____ | _____ | _____ |
| <input type="checkbox"/> Main Building Flooding | _____ | _____ | _____ |

6. Have you ever had property damage (basement, cars, furniture, etc.)? Yes No
If so, describe: _____

7. Do you have documentation of the flooding (high water marks, photos, videos)? Yes No
If so, describe: _____

8. May we contact you to discuss further? Yes No

(Please see back for additional information.)



City of Memphis – Stormwater Master Plan

Neighborhood Meeting for Southland Basin

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QUESTIONNAIRE

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1. Do you live within the Study Area? Yes No Not Sure (Please ask our team)
2. Do you own property within the Study Area? Yes No Not Sure
3. Your property is: A home A business Other _____
4. Do you own or rent your home? Own Rent
5. What flooding problems have you experienced around or near your property?

| <u>Type of Flooding</u> | <u>How Deep</u> | <u>How Often</u> | <u>Date of Last Occurrence</u> |
|---|-----------------|------------------|--------------------------------|
| <input type="checkbox"/> Street Flooding | _____ | _____ | _____ |
| <input type="checkbox"/> Yard Flooding | _____ | _____ | _____ |
| <input type="checkbox"/> Garage Flooding | _____ | _____ | _____ |
| <input type="checkbox"/> Basement Flooding | _____ | _____ | _____ |
| <input type="checkbox"/> Main Building Flooding | _____ | _____ | _____ |

6. Have you ever had property damage (basement, cars, furniture, etc.)? Yes No

If so, describe: _____

7. Do you have documentation of the flooding (high water marks, photos, videos)? Yes No

If so, describe: _____

8. May we contact you to discuss further? Yes No

901 523-2560
not in the area

(Please see back for additional information.)



City of Memphis – Stormwater Master Plan

Neighborhood Meeting for Southland Basin

April 28, 2016

QUESTIONNAIRE

The purpose of this Questionnaire is to gather input from you on the flooding and/or drainage conditions in your neighborhood. Please return completed Questionnaires to the Sign-In Desk or mail to the address on the back. **Contact information MUST be provided.**

1. Do you live within the Study Area? Yes No ___ Not Sure ___ (Please ask our team)
2. Do you own property within the Study Area? Yes No ___ Not Sure ___
3. Your property is: A home A business ___ Other _____
4. Do you own or rent your home? Own Rent ___
5. What flooding problems have you experienced around or near your property?

| Type of Flooding | How Deep | How Often | Date of Last Occurrence |
|---|----------|-----------------|-------------------------|
| <input checked="" type="checkbox"/> Street Flooding | 3-4 ft. | With every rain | |
| <input checked="" type="checkbox"/> Yard Flooding | 3-4 ft. | With every rain | |
| <input type="checkbox"/> Garage Flooding | _____ | _____ | _____ |
| <input type="checkbox"/> Basement Flooding | _____ | _____ | _____ |
| <input type="checkbox"/> Main Building Flooding | _____ | _____ | _____ |

6. Have you ever had property damage (basement, cars, furniture, etc.)? Yes No ___

If so, describe: Floors buckling

7. Do you have documentation of the flooding (high water marks, photos, videos)? Yes No ___

If so, describe: I have pictures of the flooding in back of my home and mildew marks on surface of my home, also a previous sink hole

8. May we contact you to discuss further? Yes No ___

(Please see back for additional information.)



City of Memphis – Stormwater Master Plan

Neighborhood Meeting for Southland Basin

April 28, 2016

QUESTIONNAIRE

Additional Comments:

I have water from all sides as a result land
pressure, fallen trees & sink holes. The flooding
has reached a level of 6 on my feet.
Channel five news has covered this story.

I am receiving water from across the street to
the front of my house, water from McCoskey
running east and water from the storm drain
from the front running north.

Thank you for your participation!

Personal Information (REQUIRED)

Name: Carolyn Scott

Home Address: 3349 L'Amour Rd.

Memphis, TN

Phone: (901) 262-5329 cell / 252-4179 Home

Email: CSK03@gmail.com

Please mail in no later than
May 13, 2016 to:

Powers Hill Design, LLC
80 Monroe Avenue, Suite 420
Memphis, TN 38103
Attn: SOUTHLAND

If you have questions, please email
info@southlandstormwater.com
or call 901.543.8000.



City of Memphis – Stormwater Master Plan

Neighborhood Meeting for Southland Basin

April 28, 2016

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2. Do you own property within the Study Area? Yes No Not Sure
3. Your property is: A home A business Other
4. Do you own or rent your home? Own Rent
5. What flooding problems have you experienced around or near your property?

| <u>Type of Flooding</u> | <u>How Deep</u> | <u>How Often</u> | <u>Date of Last Occurrence</u> |
|---|-----------------|------------------|--------------------------------|
| <input checked="" type="checkbox"/> Street Flooding | _____ | _____ | _____ |
| <input type="checkbox"/> Yard Flooding | _____ | _____ | _____ |
| <input type="checkbox"/> Garage Flooding | _____ | _____ | _____ |
| <input type="checkbox"/> Basement Flooding | _____ | _____ | _____ |
| <input type="checkbox"/> Main Building Flooding | _____ | _____ | _____ |

6. Have you ever had property damage (basement, cars, furniture, etc.)? Yes No

If so, describe: _____

7. Do you have documentation of the flooding (high water marks, photos, videos)? Yes No

If so, describe: _____

8. May we contact you to discuss further? Yes No

(Please see back for additional information.)



City of Memphis – Stormwater Master Plan

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April 28, 2016

QUESTIONNAIRE

Additional Comments:

Flooding at King Rd, Brooks Rd., Ford Rd from
King Rd. to Sax to Brooks Rd.
There is a Swamp on Sax and King Rd.
and dumping going on King Rd.

Thank you for your participation!

Personal Information **(REQUIRED)**

Name: Eva Strong

Home Address: 521 Gillean Rd,
Memphis, In. 38109

Phone: 901) 785-7886

Email: _____

**Please mail in no later than
May 13, 2016 to:**

Powers Hill Design, LLC
80 Monroe Avenue, Suite 420
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Attn: SOUTHLAND

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APPENDIX C

COST ESTIMATE FIGURES

FIGURE 1: IA1 Planning Level Cost Estimate

| Smith Seckman Reid, Inc | | City of Memphis | | |
|---|------|--------------------------|--------------------|---------------------|
| Southland Area Drainage Study | | Rochester Drainage Basin | | |
| Improvement Alternative 1: IA1 | | | | |
| | | | | |
| DESCRIPTION | UNIT | QUANTITY | UNIT PRICE | COST |
| Mobilization | L.S. | 1 | \$10,000.00 | \$10,000.00 |
| Removal of 24" RCP Pipe and Replace with 36" RCP Pipe | L.F. | 30 | \$200.00 | \$6,000.00 |
| Removal of 36" RCP Pipe and Replace with 48" RCP Pipe | L.F. | 217 | \$230.00 | \$49,910.00 |
| Removal of 48" RCP Pipe and Replace with 48" RCP Pipe | L.F. | 178 | \$230.00 | \$40,940.00 |
| Sidewalk Saw Cut, Removal, and Replacement | S.Y. | 27 | \$100.00 | \$2,700.00 |
| Asphalt Saw Cut, Removal, and Replacement | S.Y. | 420 | \$175.00 | \$73,500.00 |
| Curb and Gutter Saw Cut, Removal, and Replacement | L.F. | 26 | \$100.00 | \$2,600.00 |
| Removal and Replacement of Drainage Structure, 0' - 4' Depth | EACH | 2 | \$12,000.00 | \$24,000.00 |
| Removal and Replacement of Drainage Structure, 4' - 8' Depth | EACH | 2 | \$18,000.00 | \$36,000.00 |
| Channel Regrading | C.Y. | 115 | \$40.00 | \$4,600.00 |
| Channel End Transitions | L.S. | 1 | \$2,000.00 | \$2,000.00 |
| Waste Material Haul-Off | C.Y. | 105 | \$30.00 | \$3,150.00 |
| Removal and Disposal of Brush and Trees | L.S. | 1 | \$25,000.00 | \$25,000.00 |
| Traffic Control | L.S. | 1 | \$15,000.00 | \$15,000.00 |
| Erosion Control | L.S. | 1 | \$10,000.00 | \$10,000.00 |
| | | | | |
| Additional Recommendations Outside of Modeling Scope | | | | |
| Removal of 15" RCP Pipe and Replace with 24" RCP Pipe | L.F. | 34 | \$125.00 | \$4,250.00 |
| Sidewalk Saw Cut, Removal, and Replacement | S.Y. | 18 | \$100.00 | \$1,800.00 |
| Asphalt Saw Cut, Removal, and Replacement | S.Y. | 15 | \$200.00 | \$3,000.00 |
| Curb and Gutter Saw Cut, Removal, and Replacement | L.F. | 15 | \$100.00 | \$1,500.00 |
| Removal and Replacement of Drainage Structure, 0' - 4' Depth | EACH | 1 | \$12,000.00 | \$12,000.00 |
| Waste Material Haul-Off | C.Y. | 2.5 | \$30.00 | \$75.00 |
| | | | SUB-TOTAL = | \$328,025.00 |
| Construction Contingencies | | | 30% | \$98,407.50 |
| Design, Survey, CA Services | | | 20% | \$65,605.00 |
| | | | TOTAL = | \$492,037.50 |

FIGURE 2: IA2A Planning Level Cost Estimate

| Smith Seckman Reid, Inc | | City of Memphis | | |
|--|------|--------------------------|--------------------|---------------------|
| Southland Area Drainage Study | | Rochester Drainage Basin | | |
| Improvement Alternative 2: IA2A | | | | |
| | | | | |
| DESCRIPTION | UNIT | QUANTITY | UNIT PRICE | COST |
| Mobilization | L.S. | 1 | \$10,000.00 | \$10,000.00 |
| Removal of 24" RCP Pipe and Replace with (36" RCP Eq.) 45" x 29" HERCP Pipe | L.F. | 153 | \$225.00 | \$34,425.00 |
| Removal of (42" RCP Eq.) 53" x 34" HERCP Pipe and Replace with (48" RCP Eq.) 60" x 38" HERCP Pipe | L.F. | 42 | \$450.00 | \$18,900.00 |
| Removal of (42" RCP Eq.) 53" x 34" HERCP Pipe and Replace with (54" RCP Eq.) 68" x 43" HERCP Pipe | L.F. | 18 | \$525.00 | \$9,450.00 |
| Removal of 48" RCP Pipe and Replace with (54" RCP Eq.) 68" x 43" HERCP Pipe | L.F. | 379 | \$425.00 | \$161,075.00 |
| Removal of 48" RCP Pipe and Replace with (60" RCP Eq.) 73" x 45" RCAP Pipe | L.F. | 10 | \$650.00 | \$6,500.00 |
| Removal of (60" RCP Eq.) 73" x 45" RCAP Pipe and Replace with (60" RCP Eq.) 73" x 45" RCAP Pipe | L.F. | 31 | \$650.00 | \$20,150.00 |
| Sidewalk Saw Cut, Removal, and Replacement | S.Y. | 85 | \$100.00 | \$8,500.00 |
| Asphalt Saw Cut, Removal, and Replacement | S.Y. | 200 | \$175.00 | \$35,000.00 |
| | | | | |
| Curb and Gutter Saw Cut, Removal, and Replacement | L.F. | 101 | \$100.00 | \$10,100.00 |
| Removal and Replacement of Drainage Structure, 0' - 4' Depth | EACH | 2 | \$12,000.00 | \$24,000.00 |
| Removal and Replacement of Drainage Structure, 4' - 8' Depth | EACH | 9 | \$18,000.00 | \$162,000.00 |
| Removal and Disposal of Brush and Trees | L.S. | 1 | \$40,000.00 | \$40,000.00 |
| Waste Material Haul-Off | C.Y. | 245 | \$30.00 | \$7,350.00 |
| Traffic Control | L.S. | 1 | \$20,000.00 | \$20,000.00 |
| Erosion Control | L.S. | 1 | \$20,000.00 | \$20,000.00 |
| | | | SUB-TOTAL = | \$587,450.00 |
| Construction Contingencies | | | 30% | \$176,235.00 |
| Design, Survey, CA Services | | | 20% | \$117,490.00 |
| | | | TOTAL = | \$881,175.00 |

FIGURE 3: IA2B Planning Level Cost Estimate

| | | | | |
|--|------|--------------------------|----------------|---------------------|
| Smith Seckman Reid, Inc | | City of Memphis | | |
| Southland Area Drainage Study | | Rochester Drainage Basin | | |
| Improvement Alternative 2: IA2B | | | | |
| | | | | |
| DESCRIPTION | UNIT | QUANTITY | UNIT PRICE | COST |
| Mobilization | L.S. | 1 | \$10,000.00 | \$10,000.00 |
| Removal of 24" RCP Pipe and Replace with (36" RCP Eq.) 45" x 29" HERCP Pipe | L.F. | 60 | \$275.00 | \$16,500.00 |
| Asphalt Saw Cut, Removal, and Replacement | S.Y. | 69 | \$200.00 | \$13,800.00 |
| Removal and Replacement of Drainage Structure, 0' - 4' Depth | EACH | 1 | \$12,000.00 | \$12,000.00 |
| Rework Pipe Connection at Box Culvert Wall | EACH | 1 | \$3,000.00 | \$3,000.00 |
| Waste Material Haul-Off | C.Y. | 9 | \$30.00 | \$270.00 |
| Traffic Control | L.S. | 1 | \$10,000.00 | \$10,000.00 |
| Erosion Control | L.S. | 1 | \$5,000.00 | \$5,000.00 |
| | | | | |
| Additional Recommendations Outside of Modeling Scope | | | | |
| Removal of Assumed 15" RCP Pipe and Replace with (24" RCP Eq.) 30" x 19" HERCP Pipe | L.F. | 50 | \$175.00 | \$8,750.00 |
| Sidewalk Saw Cut, Removal, and Replacement | S.Y. | 36 | \$100.00 | \$3,600.00 |
| Asphalt Saw Cut, Removal, and Replacement | S.Y. | 35 | \$200.00 | \$7,000.00 |
| | | | | |
| Curb and Gutter Saw Cut, Removal, and Replacement | L.F. | 30 | \$100.00 | \$3,000.00 |
| Removal and Replacement of Drainage Structure, 0' - 4' Depth | EACH | 2 | \$12,000.00 | \$24,000.00 |
| Waste Material Haul-Off | C.Y. | 4 | \$30.00 | \$120.00 |
| | | | SUB-TOTAL = | \$117,040.00 |
| Construction Contingencies | | | 30% | \$35,112.00 |
| Design, Survey, CA Services | | | 20% | \$23,408.00 |
| | | | TOTAL = | \$175,560.00 |

FIGURE 4: IA3 Planning Level Cost Estimate

| Smith Seckman Reid, Inc | | City of Memphis | | |
|--|------|--------------------------|----------------|---------------------|
| Southland Area Drainage Study | | Rochester Drainage Basin | | |
| Improvement Alternative 3: IA3 | | | | |
| | | | | |
| DESCRIPTION | UNIT | QUANTITY | UNIT PRICE | COST |
| Mobilization | L.S. | 1 | \$10,000.00 | \$10,000.00 |
| Removal of 24" RCP Pipe and Replace with 36" RCP Pipe | L.F. | 480 | \$150.00 | \$72,000.00 |
| Removal of 24" RCP Pipe and Replace with 42" RCP Pipe | L.F. | 160 | \$200.00 | \$32,000.00 |
| Sidewalk Saw Cut, Removal, and Replacement | S.Y. | 110 | \$80.00 | \$8,800.00 |
| Asphalt Saw Cut, Removal, and Replacement | S.Y. | 440 | \$175.00 | \$77,000.00 |
| Curb and Gutter Saw Cut, Removal, and Replacement | L.F. | 340 | \$80.00 | \$27,200.00 |
| Removal and Replacement of Drainage Structure, 4' - 8' Depth | EACH | 3 | \$18,000.00 | \$54,000.00 |
| Waste Material Haul-Off | C.Y. | 78 | \$30.00 | \$2,340.00 |
| Traffic Control | L.S. | 1 | \$15,000.00 | \$15,000.00 |
| Erosion Control | L.S. | 1 | \$10,000.00 | \$10,000.00 |
| | | | | |
| Additional Recommendations Outside of Modeling Scope | | | | |
| Removal of Assumed 15" RCP Pipe and Replace with 24" RCP Pipe | L.F. | 31 | \$125.00 | \$3,875.00 |
| Removal of 24" RCP Pipe and Replace with 36" RCP Pipe | L.F. | 48 | \$200.00 | \$9,600.00 |
| Sidewalk Saw Cut, Removal, and Replacement | S.Y. | 36 | \$100.00 | \$3,600.00 |
| Asphalt Saw Cut, Removal, and Replacement | S.Y. | 64 | \$200.00 | \$12,800.00 |
| Curb and Gutter Saw Cut, Removal, and Replacement | L.F. | 30 | \$100.00 | \$3,000.00 |
| Removal and Replacement of Drainage Structure, 4' - 8' Depth | EACH | 1 | \$18,000.00 | \$18,000.00 |
| Removal and Replacement of Drainage Structure, 0' - 4' Depth | EACH | 1 | \$12,000.00 | \$12,000.00 |
| Waste Material Haul-Off | C.Y. | 10 | \$30.00 | \$300.00 |
| | | | SUB-TOTAL = | \$371,515.00 |
| Construction Contingencies | | | 30% | \$111,454.50 |
| Design, Survey, CA Services | | | 20% | \$74,303.00 |
| | | | TOTAL = | \$557,272.50 |

FIGURE 5: IA4 Planning Level Cost Estimate

| Smith Seckman Reid, Inc | | City of Memphis | | |
|--|------|-------------------------|--------------------|---------------------|
| Southland Area Drainage Study | | Red Budd Drainage Basin | | |
| Improvement Alternative 4: IA4 | | | | |
| | | | | |
| DESCRIPTION | UNIT | QUANTITY | UNIT PRICE | COST |
| Mobilization | L.S. | 1 | \$10,000.00 | \$10,000.00 |
| Removal of 24" RCP Pipe and Replace with (36" RCP Eq.) 45" x 29" HERCP Pipe | L.F. | 368 | \$200.00 | \$73,600.00 |
| Sidewalk Saw Cut, Removal, and Replacement | S.Y. | 90 | \$100.00 | \$9,000.00 |
| Asphalt Saw Cut, Removal, and Replacement | S.Y. | 285 | \$175.00 | \$49,875.00 |
| Curb and Gutter Saw Cut, Removal, and Replacement | L.F. | 180 | \$80.00 | \$14,400.00 |
| Removal and Replacement of Drainage Structure, 4' - 8' Depth | EACH | 3 | \$18,000.00 | \$54,000.00 |
| Rework Pipe Connection at Concrete Channel Wall | EACH | 1 | \$3,000.00 | \$3,000.00 |
| Waste Material Haul-Off | C.Y. | 55 | \$30.00 | \$1,650.00 |
| Removal and Disposal of Brush and Trees | L.S. | 1 | \$30,000.00 | \$30,000.00 |
| Traffic Control | L.S. | 1 | \$30,000.00 | \$30,000.00 |
| Erosion Control | L.S. | 1 | \$20,000.00 | \$20,000.00 |
| | | | | |
| Additional Recommendations Outside of Modeling Scope | | | | |
| Removal of 18" RCP Pipe and Replace with (24" RCP Eq.) 30" x 19" HERCP Pipe | L.F. | 183 | \$150.00 | \$27,450.00 |
| Sidewalk Saw Cut, Removal, and Replacement | S.Y. | 73 | \$100.00 | \$7,300.00 |
| Asphalt Saw Cut, Removal, and Replacement | S.Y. | 130 | \$175.00 | \$22,750.00 |
| Curb and Gutter Saw Cut, Removal, and Replacement | L.F. | 70 | \$100.00 | \$7,000.00 |
| Removal and Replacement of Drainage Structure, 0' - 4' Depth | EACH | 3 | \$12,000.00 | \$36,000.00 |
| Waste Material Haul-Off | C.Y. | 10 | \$30.00 | \$300.00 |
| | | | SUB-TOTAL = | \$396,325.00 |
| Construction Contingencies | | | 30% | \$118,897.50 |
| Design, Survey, CA Services | | | 20% | \$79,265.00 |
| | | | TOTAL = | \$594,487.50 |

FIGURE 6: IA8A Planning Level Cost Estimate

| Smith Seckman Reid, Inc | | City of Memphis | | |
|--|------|-----------------------|----------------|---------------------|
| Southland Area Drainage Study | | Rosita Drainage Basin | | |
| Improvement Alternative 8: IA8A | | | | |
| DESCRIPTION | UNIT | QUANTITY | UNIT PRICE | COST |
| Mobilization | L.S. | 1 | \$10,000.00 | \$10,000.00 |
| Removal of 36" CMP Culvert and Replace with (54" RCP Eq.) 68" x 43" HERCP Culvert | L.F. | 14 | \$525.00 | \$7,350.00 |
| Removal of two parallel 42" RCP Culverts and Replace with 60" RCP Culvert | L.F. | 42 | \$600.00 | \$25,200.00 |
| Asphalt Saw Cut, Removal, and Replacement | S.Y. | 95 | \$200.00 | \$19,000.00 |
| Removal and Replacement of Drainage Structure, 4' - 8' Depth | EACH | 2 | \$18,000.00 | \$36,000.00 |
| Removal and Replacement of Drainage Structure, 8' - 12' Depth | EACH | 2 | \$25,000.00 | \$50,000.00 |
| Channel Regrading | C.Y. | 1900 | \$40.00 | \$76,000.00 |
| Channel End Transitions | L.S. | 1 | \$5,000.00 | \$5,000.00 |
| Removal and Disposal of Brush and Trees | L.S. | 1 | \$70,000.00 | \$70,000.00 |
| Waste Material Haul-Off | C.Y. | 885 | \$30.00 | \$26,550.00 |
| Traffic Control | L.S. | 1 | \$15,000.00 | \$15,000.00 |
| Erosion Control | L.S. | 1 | \$30,000.00 | \$30,000.00 |
| | | | SUB-TOTAL = | \$370,100.00 |
| Construction Contingencies | | | 30% | \$111,030.00 |
| Design, Survey, CA Services | | | 20% | \$74,020.00 |
| | | | TOTAL = | \$555,150.00 |

FIGURE 7: IA8B Planning Level Cost Estimate

| | | | | |
|--|------|-----------------------|----------------|---------------------|
| Smith Seckman Reid, Inc | | City of Memphis | | |
| Southland Area Drainage Study | | Rosita Drainage Basin | | |
| Improvement Alternative 8: IA8B | | | | |
| | | | | |
| DESCRIPTION | UNIT | QUANTITY | UNIT PRICE | COST |
| Mobilization | L.S. | 1 | \$10,000.00 | \$10,000.00 |
| Removal of 24" RCP Culvert and Replace with (36" RCP Eq.) 44" x 27" RCAP Culvert | L.F. | 37 | \$275.00 | \$10,175.00 |
| Asphalt Saw Cut, Removal, and Replacement | S.Y. | 30 | \$200.00 | \$6,000.00 |
| Removal and Replacement of Drainage Structure, 0' - 4' Depth | EACH | 2 | \$12,000.00 | \$24,000.00 |
| Removal of 24" RCP Culvert | L.F. | 15 | \$40.00 | \$600.00 |
| Removal of Drainage Structure, 0' - 4' Depth | EACH | 1 | \$2,500.00 | \$2,500.00 |
| Channel Regrading | C.Y. | 430 | \$40.00 | \$17,200.00 |
| Saw Cut Existing Concrete Channel Walls 1' from Top Below Embedded Fence Posts | L.F. | 2280 | \$15.00 | \$34,200.00 |
| Removal of Chain Link Fence and Saw Cut Concrete Wall Sections | L.F. | 2280 | \$20.00 | \$45,600.00 |
| Reinforced Concrete Channel Construction (New Channels and Existing Channel Wall Modifications) | C.Y. | 160 | \$1,300.00 | \$208,000.00 |
| Chain Link Fence Placement in Concrete Channel Walls | L.F. | 2800 | \$25.00 | \$70,000.00 |
| Channel End Transitions and Existig Channel Connection Modifications | L.S. | 1 | \$10,000.00 | \$10,000.00 |
| Removal and Disposal of Brush and Trees | L.S. | 1 | \$100,000.00 | \$100,000.00 |
| Waste Material Haul-Off | C.Y. | 225 | \$30.00 | \$6,750.00 |
| Traffic Control | L.S. | 1 | \$10,000.00 | \$10,000.00 |
| Erosion Control | L.S. | 1 | \$15,000.00 | \$15,000.00 |
| | | | SUB-TOTAL = | \$570,025.00 |
| Construction Contingencies | | | 30% | \$171,007.50 |
| Design, Survey, CA Services | | | 20% | \$114,005.00 |
| | | | TOTAL = | \$855,037.50 |