



# Getting To Implementation: Program Options for Puerto Rico

CENTER FOR  
WATERSHED  
PROTECTION

**Puerto Rico is Not Alone!**

**Implementation is Difficult**





**\$738,500,000**

**Soil loss @150  
tons/ac/year**

**16,500,000 tons**

**15,670,000 cu. yd.**

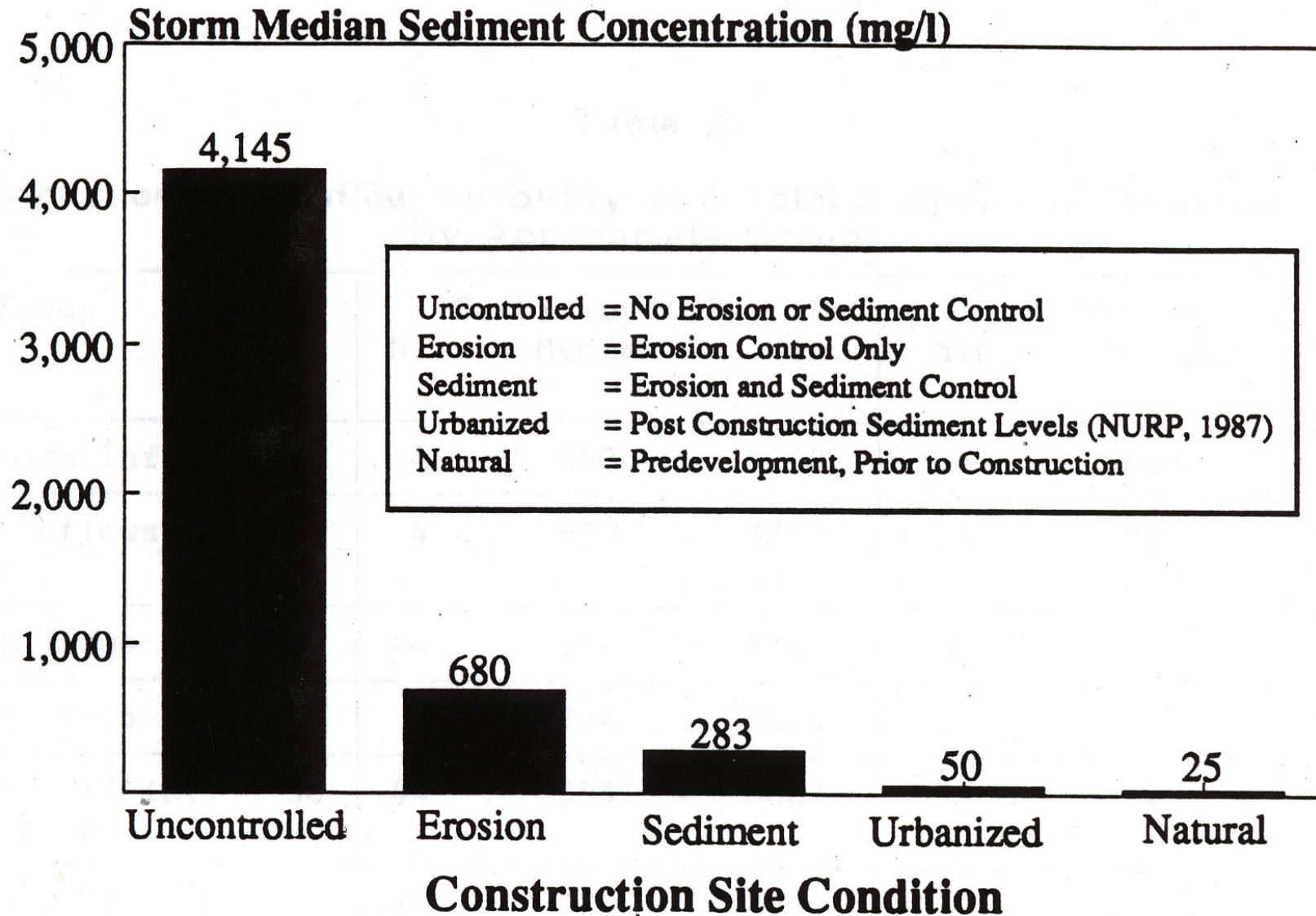
**Statewide activity  
10,000 sites**

**Approximately  
110,000 ac.  
disturbance**

**State of MD**



# Effect of Erosion and Sediment Control Measures On Suspended Sediment Concentrations From Piedmont Construction Sites



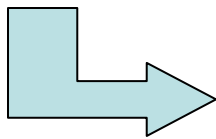
Source: Schueler and Lugbill, 1990

An aerial photograph of a river. The water is a mix of dark blue and greenish-brown. A large, light-colored sandbar or island is visible in the lower right quadrant. A small boat with a mast is on the left side of the river. The text is overlaid on the right side of the image.

## **Erosion Control Implementation?**

- **Staff & Resources**
- **Politics (Enforcement)**
- **Conventional Way of Doing Things**
- **Agency Coordination**

# Why Implementation is Important!



## **Selected Program Options for ESC (Derived From 1/29/06 Meeting)**

- **Private Certifications & Licensing**
- **Performance Bonds**
- **Training for Inspectors**
- **Conditions in Contracts**
- **Incentives Through Review Process  
(Streamlining)**
- **Enforcement (Civil Penalties)**
- **Demonstration Projects (Caguas)**
- **Others?**



# ESC Implementation Tool #1

## Private certifications and licensing



Source: Delaware Sediment and Stormwater Program



# **1. Private Certification and Licensing**

## **What It Is:**

- Training program for contractors, private inspectors, and plan preparers**
- Attend training session, take exam and receive official sanction**
- Maintain an official list**
- List tied to certain requirements – plan approval, weekly inspections, onsite presence, etc.**

# **1. Private Certification and Licensing: Delaware Sediment & Stormwater Program**

- **State requires a Certified Construction Reviewer (CCR) to provide inspection duties**
- **State provides certification**
- **CCR must become familiar with site plan**
- **Reports prepared by CCR on weekly basis throughout duration of project**
- **ESC controls must be in accordance with approved plan and Handbook; non-compliance must be reported to State**
- **State pursues enforcement actions**
- **State has ability to revoke certification**

# Virginia DOT: Contractor Certification

The screenshot shows a Mozilla Firefox browser window displaying the Virginia DOT website. The address bar shows the URL: <http://www.virginiadot.org/business/environmental-essce-overview.asp>. The page title is "VDOT Environmental Division, Erosion and Sediment Control - Mozilla Firefox".

The website header includes the VDOT logo (Virginia Department of Transportation) and navigation links: About VDOT, Maps, Careers, News, Contact Us. Below the header is a search bar and a menu with options: Road Conditions, Travel Center, Business Center, Programs, Projects & Studies.

The main content area is titled "Erosion and Sediment Control Contractor Certification". It includes a "Background" section with the following text:

**Background**  
In accordance with VDOT Road and Bridge Specification §107.14 (a), land disturbing activity which occurs within the VDOT right-of-way must be supervised by a certified Erosion and Sediment Control (ESC) Contractor who is required to be on-site at all times during that land-disturbing activity. Until last year, the Virginia Department of Conservation and Recreation (DCR) and VDOT sponsored a cooperative training for ESC Contractors. This training program was entitled DCR's Erosion and Sediment Control Contractor Certificate of Completion (DCR's Contractor Certificate) program. The former DCR Contractor Certificate program included a one-day training course followed by a 1-hour examination. From April 1999 through June 2001, VDOT contractors successfully obtained over 5,500 individual certifications through DCR's program. The DCR Contractor Certificate program is believed to have provided a key contribution to VDOT project

Navigation and utility links on the right side include: Español, SWAM Links (with sub-links for SWAM Certification, Resources for Virginia Business, and Virginia Department of Business Assistance), and Business User (with sub-links for Traffic Data, Request for Proposals, RFP Results, and Request for Quotes).

The left sidebar contains a "Business Center" section with links for: Proposals & Bidding, Contract Awards (Request for Quotes, Short List & Selected, Bid Letting (Const)), Online Forms, and Events.

The Windows taskbar at the bottom shows the Start button, several open applications (Inbox - Microsoft..., Virginia Road an..., VDOT Environme...), and the system clock showing 7:45 AM.

Required for Contractor to Get State Contract for Road Work



# 1. Private Certification and Licensing

## PROS

- Tied to economic incentive
- Simple administration from centralized agency
- Provides consequences for bad actors

## CONS

- Self-policing seldom adequate as stand alone enforcement tool
- Bad actor consequences can be hard to enforce

# ESC Implementation Tool #2



**Performance Bonds**

## **2. Performance Bonds**

### **What It Is:**

- Financial Surety Posted Prior to Plan Approval and/or Grading Permit**
- Motivator for Compliance**
- Usually Required in Code**
- Allows Program Authority to Cash Bond & Conduct Work if Applicant is not in Compliance**



## **2. Performance Bond Example: Albemarle County, VA**

- Bond posted for Erosion & Sediment Control & Stormwater Management prior to plan approval**
- Bond estimate based on cost + 25%**
- Partial bond reductions based on inspection – retain 20% until complete**
- Annual renewal fee – extensions beyond 1 year discouraged**
- Bonds tracked in data base**
- Bonds cashed in rare instances**
- Administration – 20% of FTE (60 bonds annually)**

## 2. Performance Bonds

### PROS

- Economic incentive for compliance
- Good complement to other enforcement tools

### CONS

- Administrative burden (compute bonds, inspections, data base)
- Politically & administratively difficult to cash bonds & perform work
- Bonds need a life span

# ESC Implementation Tool #3

## Training for Inspectors



Source: MDE Stormwater Management Program



# **3. Training for Inspectors**

## **What It Is:**

- Training for those involved in carrying out or complying with inspection aspects of ESC**
- Can be tied into private certifications**
- Can consist of a one-day course covers minimum standards and specifications for conservation practices, basic soil mechanics and inspector skills**
- Require recertification every 3 years or so**

### **3. Training for Inspectors Example: Virginia DCR**

- **Erosion and Sediment Control Training and Certification**
  - localities are required to have a certified inspector
  - Initial certification requires an Erosion and Sediment Control 101 course and one specifically geared at inspection
  - Inspectors must be recertified every 3 years
  - Recertification can be completed through online course
  - Maintains a list of certified inspectors on

# 3. Training for Inspectors

## PROS

- Simple
- Builds motivation
- Keep inspectors up-to-date on technologies
- Help provide consistent enforcement

## CONS

- Turnover?
- Uncertain results

# ESC Implementation Tool #4



## **4. Conditions in Contracts**

### **What It Is:**

- Contracts for government work (roads, municipal projects, etc.) specify training, preparation of plans, and compliance**
- May be coordinated with training and/or certification program**

## **4. Contract Example: CalTrans**

- **Storm Water Management Enforcement Guidance Manual – Standard Specs**
  - Contractor develops water pollution control program
  - State not liable for delays due to lack of program
  - Temporary or permanent stabilization for each 70,000 square meters (17.3 acres)



## **4. Contract Example: CalTrans**

- **Storm Water Management Enforcement Guidance Manual – Special Provisions**
  - **Storm Water Pollution Prevention Plan as per State Manual**
  - **Retention of funds for noncompliance (25%) (most effective compliance tool)**
  - **Training for water pollution control manager (annual certification)**

## **4. Contract Example: CalTrans**

- **Storm Water Management Enforcement Guidance Manual – Special Provisions (cont.)**
  - **Special rainy season plans (max. disturbed)**
  - **Inspections & Maintenance**
  - **Scheduling**
  - **Removal of temporary BMPs**
  - **Suspension of work/contract termination**

## 4. Contract Conditions

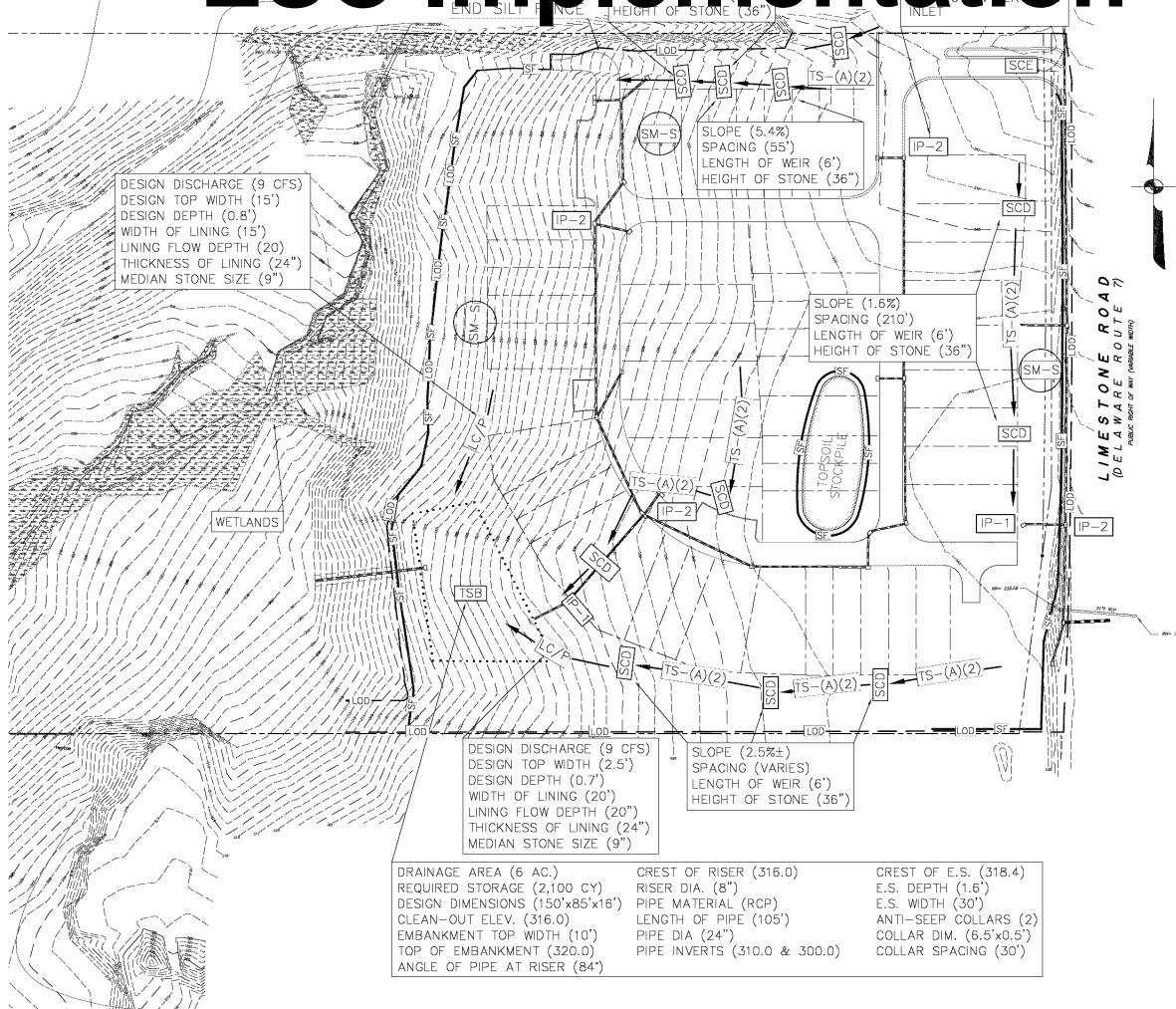
### PROS

- **Highlights Erosion Control Early in Process (contract)**

### CONS

- **Often forgotten during construction, except if there is conflict**
- **Difficult to Enforce (legal action)**

# ESC Implementation Tool #5



- LEGEND**
- STABILIZATION MATTING - SLOPE
  - STONE CHECK DAM
  - STORM INLET PROTECTION (TYPE-1)
  - STORM INLET PROTECTION (TYPE-2)
  - TEMPORARY SEDIMENT BASIN
  - STABILIZED CONSTRUCT. ENTRANCE
  - TEMPORARY SWALE
  - LINED CHANNEL - PARABOLIC
  - TEMPORARY EARTH BERM
  - SILT FENCE
  - LIMIT OF DISTURBANCE
  - PROPERTY LINE
  - WETLANDS
  - BASIS AREA
  - PROPOSED CONTOUR
  - EXISTING CONTOUR

**EROSION & SEDIMENT CONTROL  
SCHEMATIC PLAN  
POST-DEVELOPED PHASE  
ADARE VILLAGE**

1" = 50' FT

DESIGN DISCHARGE (9 CFS)  
DESIGN TOP WIDTH (15')  
DESIGN DEPTH (0.8')  
WIDTH OF LINING (15')  
LINING FLOW DEPTH (20")  
THICKNESS OF LINING (24")  
MEDIAN STONE SIZE (9")

SLOPE (5.4%)  
SPACING (55')  
LENGTH OF WEIR (6')  
HEIGHT OF STONE (36")

SLOPE (1.6%)  
SPACING (210')  
LENGTH OF WEIR (6')  
HEIGHT OF STONE (36")

DESIGN DISCHARGE (9 CFS)  
DESIGN TOP WIDTH (2.5')  
DESIGN DEPTH (0.7')  
WIDTH OF LINING (20")  
LINING FLOW DEPTH (20")  
THICKNESS OF LINING (24")  
MEDIAN STONE SIZE (9")

SLOPE (2.5%±)  
SPACING (VARIES)  
LENGTH OF WEIR (6')  
HEIGHT OF STONE (36")

DRAINAGE AREA (6 AC.) REQUIRED STORAGE (2,100 CY) DESIGN DIMENSIONS (150'x85'x16') CLEAN-OUT ELEV. (316.0) EMBANKMENT TOP WIDTH (10') TOP OF EMBANKMENT (320.0) ANGLE OF PIPE AT RISER (84°)	CREST OF RISER (316.0) RISER DIA. (8") PIPE MATERIAL (RCP) LENGTH OF PIPE (105') PIPE DIA. (24") PIPE INVERTS (310.0 & 300.0)	CREST OF E.S. (318.4) E.S. DEPTH (16') E.S. WIDTH (30') ANTI-SLEEP COLLARS (2) COLLAR DIM. (6.5'x0.5') COLLAR SPACING (30')
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# Incentives Through Review Process

<b>VANDEMARK &amp; LYNCH, INC.</b> ENGINEERS - PLANNERS - SURVEYORS 4300 WILDER RD. #200 BOX 0447 WILMINGTON, DE 19806/(302) 764-7633				
PERMANENT FILE NO. DATE REVIEW APPROVED BY	REFERENCE DRAWINGS SHEET NO. 20764	SHEET NO. 36959-L	SHEET 2 OF 5	REVISION

# Process

# **5. Incentives Through Review Process**

## **What It Is:**

- Review and Approval process for site plans is sometimes time consuming and results in lengthy delay**
- Use a ESC checklist to verify complete plan**
- If plan is complete and meets checklist, it becomes a fast-track priority**

# 5. Incentives Through Review Process

## PROS

- Carrot
- Leads to better plans
- Encourage interagency coordination

## CONS

- Delays in approval usually a symptom of several issues (lack of staff, etc.) – may not be as simple as moving to top
- Only applies to review stage, does not ensure good implementation
- Result in inadequate



# ESC Implementation Tool #6



**Enforcement:  
Civil Penalties**

## **6. Enforcement: Civil Penalties**

### **What It Is:**

- Specified in Code**
- Civil Fines for Specified Violations (like a traffic ticket)**
- Requires Trained Inspection Staff**

# **Existing PR Regulation: Regulation for the Control of Erosion and Prevention of Sedimentation (EQB)**

- **Rule 1240.D**
- **Rule 1260**
  - **Cease & Desist**
  - **Show Cause Orders**
  - **Revoke Permits**
  - **Administrative Fines up to \$25,000 per day**
  - **Contumacy Fines up to \$50,000 per day**
  - **Criminal Penalties**



**DIRT  
COPS**

**6. Civil Penalties**

**1 4:34 PM**



# 6. Civil Penalties Example: Roanoke County, VA Ticket Book

**ROANOKE COUNTY COMMUNITY DEVELOPMENT  
EROSION & SEDIMENT CONTROL  
SUMMONS**

Project Name/Tax Map #: \_\_\_\_\_ File No. \_\_\_\_\_ Inspection Date: \_\_\_\_\_ Time: \_\_\_\_\_

Inspected by: \_\_\_\_\_ Owner/Developer: \_\_\_\_\_ RLD: \_\_\_\_\_

Location of Violation(s): \_\_\_\_\_

_____ LAND DISTURBING WITHOUT A PERMIT .....	\$1000/DAY	X	_____ DAYS = _____
_____ STD 3.01..... Safety Fence .....	\$100/DAY	X	_____ DAYS = _____
_____ STD 3.02..... Construction Entrance .....	\$100/DAY	X	_____ DAYS = _____
_____ STD 3.03..... Construction Road Stabilization .....	\$100/DAY	X	_____ DAYS = _____
_____ STD 3.04..... Straw Bale Barrier .....	\$100/DAY	X	_____ DAYS = _____
_____ STD 3.05..... Silt Fence.....	\$100/DAY	X	_____ DAYS = _____
_____ STD 3.06..... Brush Barrier.....	\$100/DAY	X	_____ DAYS = _____
_____ STD 3.07..... Storm Drain Inlet Protection .....	\$100/DAY	X	_____ DAYS = _____
_____ STD 3.08..... Culvert Inlet Protection .....	\$100/DAY	X	_____ DAYS = _____

## 6. Civil Penalties

### PROS

- **Effective Compliance**
- **Easier to Apply than Criminal Penalties**

### CONS

- **Political Will Needed to Apply Tool**
- **Need Control of “Renegade” Inspectors**
- **Need Enough Inspectors to Document Conditions at Sites**
- **Judges Not Always Sympathetic**



# ESC Implementation Tool #7

**Demonstration  
Projects**

6.28.2000



# 7. Demonstration Projects

## What It Is:

- demonstration projects that illustrate the use, design, installation and maintenance of innovative erosion and sediment control practices
- Incorporate into workshops, certifications, tours, websites, etc.

## **7. Demonstration Projects Example: UVI Cooperative Extension Service**

- **Installed ESC practices at the CES Home Demonstration Garden**
- **Demonstrate the proper use and installation of practices not widely used in the territory:**
  - **erosion control mats, hydroseeding, and triangular dikes**
- **Demonstrate the proper siting, installation and maintenance of silt fencing;**
- **Display different native and adapted grasses and ground covers that can be used for erosion control; and**
- **Provide public education and outreach on effective erosion and sediment control methods**

# 7. Demonstration Project

## PROS

- **Non-threatening but convincing**
- **Allows govt agencies to set good example and high bar**
- **Good outreach potential**
- **Grants/Funding**

## CONS

- **Temporary**
- **Risk factor – some projects fail**
- **One piece of puzzle**

**Other?**

