

Company CEO: _____

Company Name

Product demonstration station officials: _____

Company is approved for image recognition software

Check here if the company presented you with a JSA (Job Safety Analysis)

| Safety Check and Set-Up (up to 10 points) | Points | | |
|---|--------|---|--------------|
| Company presents safety card or signed safety inspection sheet. | 0 | 5 | |
| Vehicle and control system present no safety hazards. | 0 | 5 | |
| Examples: <ul style="list-style-type: none"> o All power cords, power bars, pressurized cylinders, etc. are secured. o No hazardous materials are leaking onto the pool deck. o Vehicle is hand-launched by team members in a safe manner. | | | |
| Company is cleared for demonstration: _____ (official's initials) | | | Total |
| Total Safety Check and Set-Up (out of 10) | | | |
| <i>Note: An official's decision to disqualify a company due to safety concerns is final. If there is a safety concern, please contact the lead safety inspector or competition coordinator.</i> | | | |

| Organizational and Operational Effectiveness (up to 10 points) | Points | | |
|---|--------|---|--------------|
| Up to 2 points – Organization | | | |
| Chain of command evident | 0 | 1 | |
| Roles clear and executed well | 0 | 1 | |
| Up to 2 points – Task Plan | | | |
| Task plan is well thought out to maximize score | 0 | 1 | |
| Alternate plans available and all team members are aware of the plan | 0 | 1 | |
| Up to 2 points –Time Management | | | |
| Awareness of time | 0 | 1 | |
| Adjusting timeline to adapt to situations | 0 | 1 | |
| Up to 2 points – Team Cooperation | | | |
| Composure under pressure | 0 | 1 | |
| Supportive of each other and communicate well with each other | 0 | 1 | |
| Up to 2 points – ROV Deployment and Control | | | |
| ROV deployed by the end of the 5-minute set-up period | 0 | 1 | |
| ROV is under control of pilot and prepared to perform tasks | 0 | 1 | |
| Total Organizational and Operational Effectiveness (out of 10) | | | Total |

| Bonus points for size and weight | Points | | | |
|--|--------|---|----|--------------|
| Size bonus (up to 10 points) | | | | |
| ROV is less than 60 cm – 10 bonus points | 0 | 5 | 10 | |
| ROV is within 60.1 cm and 75 cm – 5 bonus points | | | | |
| ROV is within 75.1 cm and 85 cm – 0 bonus points | | | | |
| Vehicles larger than 85 cm may not compete | | | | |
| Judge initials: _____ | | | | Total |
| CEO initials: _____ | | | | |
| Weight bonus (up to 10 points) | | | | |
| ROV is less than 15 kg – 10 bonus points | 0 | 5 | 10 | |
| ROV is between 15.01 kg and 20 kg – 5 bonus points | | | | |
| ROV is between 20.01 kg and 25 kg – 0 bonus points | | | | |
| Vehicles heavier than 25 kg may not compete | | | | |
| Judge initials: _____ | | | | Total |
| CEO initials: _____ | | | | |

| Task # 1: Ensuring Public Safety - Dam Inspection and Repair (up to 90 points) | Points | | |
|---|--------|----|--------------|
| Judges' Notes: Companies may complete the steps of this task in any order. | | | |
| 1.1 up to 25 points – inspecting the foundation of the dam | | | |
| 5 points – following a transect line | 0 | 5 | |
| 5 points – identifying and counting the number of cracks | 0 | 5 | |
| o gathering information about the size of the cracks | | | |
| o determining the length of the longest crack | 0 | 5 | 10 |
| 10 points – length within 1.0 cm of true length | | | |
| 5 points – length between 1.1 and 2 cm of true length | | | |
| 0 points – Length not within 2.1 cm of true length | | | |
| 5 points - mapping the location of the cracks | 0 | 5 | |
| 1.2 10 points – inserting grout into voids underneath the dam | 0 | 10 | |
| 1.3 up to 20 points – inspecting and repairing a trash rack | | | |
| 10 points – removing the damaged screen of the trash rack | 0 | 10 | |
| 10 points – installing a new screen | 0 | 10 | |
| 1.4 up to 35 points – deploying a secondary, micro-ROV from the primary ROV to inspect the inside of the drain pipe for indicators of a possible dam failure | | | |
| o identifying areas of muddy water flow inside the pipe using: | 0 | 20 | 30 |
| 30 points – Micro-ROV only connected to primary ROV by fiber optic cabling | | | |
| 20 points – Micro-ROV connected to primary ROV by copper wiring | | | |
| 5 points – docking the micro-ROV to the primary ROV | 0 | 5 | |
| Total Task # 1 (out of 90) | | | Total |

| Task # 2: Maintaining Healthy Waterways (up to 90 points) | Points | | |
|---|--------|----|----|
| Judges' Notes: Companies may complete the steps of this task in any order. | | | |
| 2.1 up to 30 points – monitoring water quality | | | |
| o measuring the water temperature | 0 | 5 | 10 |
| 10 points – temperature measurement within 2 C of benchmark | | | |
| 5 points – temperature measurement between 2 and 4 C of benchmark | | | |
| 0 points – temperature measurement is not within 4 C of benchmark | | | |
| 10 points - collecting a water sample from the bottom | 0 | 10 | |
| o using a water monitoring kit to | | | |
| 5 points – measure the pH of the water sample | 0 | 5 | |
| 5 points – measure the phosphate levels of the water sample | 0 | 5 | |
| 2.2 up to 25 points – determining habitat diversity | | | |
| 5 points – lifting a rock from the bottom | 0 | 5 | |
| o examining the benthic species underneath the rock | 0 | 5 | 20 |
| 5 points – using a handbook to determine the number and type of benthic species | | | |
| 20 points – using image recognition to determine the number and type of benthic species | | | |
| 5 points – recording the date, time, temperature, pH, phosphate levels and species diversity on a data sheet | 0 | 5 | |

| | | | | |
|--|---|---|----|--------------|
| 2.3 5 points each, 10 points total – transporting and releasing trout fry | 0 | 5 | 10 | |
| 2.4 up to 20 points - restoring fish habitat | | | | |
| 10 points – removing a degraded rubber tire | 0 | | 10 | |
| 10 points – installing a new fish/reef ball | 0 | | 10 | |
| Total Task # 2 (out of 90) | | | | Total |

| Task # 3: Preserving History (up to 90 points) | Points | | | | |
|---|--------|---|----|----|--------------|
| Judges' Notes: Companies may choose to recover the cannon or mark the location of the cannon shells first. Once companies begin lift operations on the cannon, they cannot receive further points for any calculations | | | | | |
| 3.1 up to 70 points – recovering the Civil War era cannon | | | | | |
| 5 points – prior to the competition, determining the lift capability of your ROV | 0 | | 5 | | |
| o Calculating the amount of force needed to lift the cannon | | | | | |
| o up to 30 points - calculating the volume of the cannon | | | | | |
| o Length measurement | 0 | | 5 | | |
| 5 points – within 1 cm of true length | | | | | |
| 0 points – not within 1 cm of true length | | | | | |
| o Radius 1 measurement | 0 | | 5 | | |
| 5 points – within 0.5 cm of true length | | | | | |
| 0 points – not within 0.5 cm of true length | | | | | |
| o Radius 2 measurement | 0 | | 5 | | |
| 5 points – within 0.5 cm of true length | | | | | |
| 0 points – not within 0.5 cm of true length | | | | | |
| o Radius 3 measurement | 0 | | 5 | | |
| 5 points – within 0.5 cm of true length | | | | | |
| 0 points – not within 0.5 cm of true length | | | | | |
| 10 points - Volume calculation within 10 cm ³ of actual | 0 | | 10 | | |
| 5 points - using the cannon's casting mark to identify the build location and build date and consulting a handbook to determine the composition | 0 | | 5 | | |
| 5 points - Calculating the weight of the cannon in water | 0 | | 5 | | |
| 5 points - Determining if the ROV has enough thrust to lift the cannon | 0 | | 5 | | |
| 20 points - returning the cannon to the surface side of the pool | 0 | | 20 | | |
| 3.2 5 points each, 20 points total – identifying and marking the location of metal cannon shells / non-metal debris | 0 | 5 | 10 | 15 | 20 |
| Total Task # 3 (out of 90) | | | | | Total |

Fuses: ROV systems are allowed one replacement fuse during the product demonstration. In the event that the ROV system blows the second fuse during the demonstration, time will stop, the demonstration run will be over, and no additional points will be earned. Companies should have adequate replacement fuses on hand, MATE will not provide replacements.

| Penalty Points (deduct 5 points for each infraction) | No. of Infractions |
|---|-----------------------|
| Tether Pulling: Company members cannot pull on the tether to assist in moving or turning the vehicle. Judges should issue a warning for the first infraction and begin deducting points AFTER the first infraction. | a |
| Illegal communication: Company members at the side of the pool may not communicate visual evidence of the ROV status such as location of vehicle, need to turn, that the vehicle is stuck, etc. | b |
| Debris: Companies that leave debris (e.g. parts of their ROV, including weights and flotation) in the pool at the end of the product demonstration time, or leave debris that a diver must retrieve will receive penalty points. Product demonstration props are NOT considered debris. A company constructed collection basket is considered debris if it is still in the water when product demonstration time ends. | c |
| Diver Assistance: Any diver assistance (if available) must be requested by the company and will result in a 5 point penalty. The clock does not stop during diver assistance. | d |
| | (total a + b + c + d) |
| Total Penalty Points | X 5 = |
| | Total |

| TIME BONUS (1 point for every minute and 0.01 point for every second under 15 minutes) |
|--|
| Duration of Product Demonstration: _____ |
| Minutes under 15 remaining: _____ X 1 point = _____ |
| Seconds remaining: _____ X 0.01 point = _____ |
| Time bonus |
| Total |

| | |
|--|--------------------|
| TOTAL PRODUCT DEMONSTRATION SCORE | Grand Total |
|--|--------------------|

Official's initials: _____

Company CEO's initials: _____