

# Using Insights for ArcGIS to Explore and Understand Risk Analysis Results

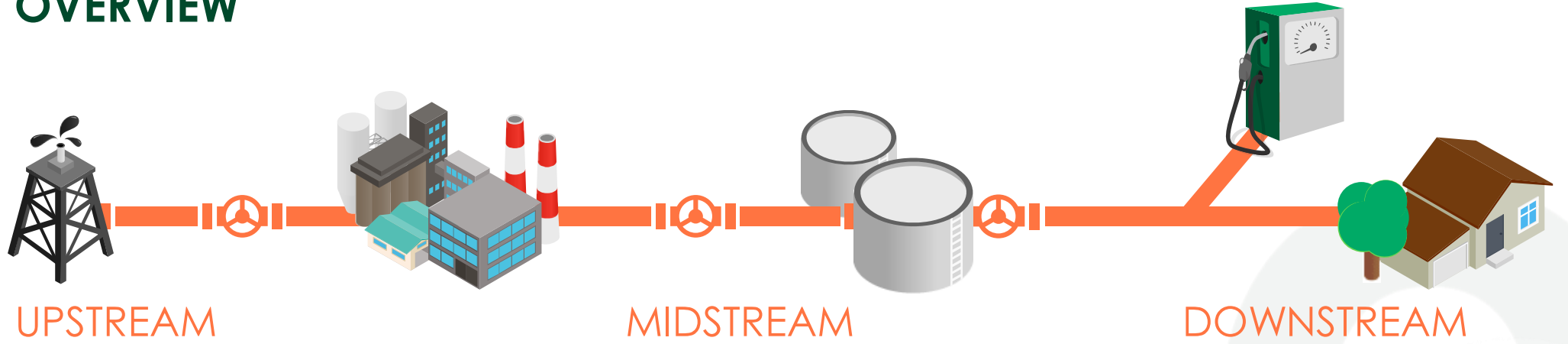
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# COMPANY OVERVIEW

Domain



Values



Solutions



Enabling Services & Technologies



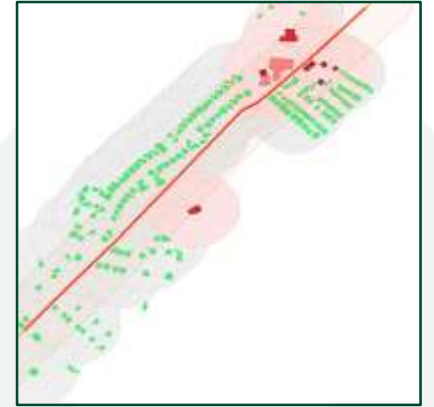


- ✓ Overview of pipeline risk analysis
  - How does it work?
  - Why do we need a viewer
- ✓ Why use Insights for ArcGIS as a data exploration tool
  - Limitations of traditional methods
  - Review of recent advancements in Insights
- ✓ Prepping Data for use in ArcGIS Online
- ✓ Insights demo
- ✓ Conclusions

# Pipeline Risk Analysis – The Basics



- ✓ An understanding of risk is critical to safely operating pipeline assets
  - Identified threats of concern dictate:
    - Assessment methods used to evaluate pipe condition
    - Preventative and mitigative measures
- ✓ Risk Analysis is required for regulatory compliance
  - Pipeline Safety Improvement Act of 2002 (PL 107-355)
    - Hazardous Liquids – [49 CFR §195.452](#) – Integrity program management requirements effective starting in 2002
      - ✓ Hazardous liquids lines that could affect an HCA are subject to integrity management program requirements
    - Natural Gas - [49 CFR §192 Subpart O](#) – Integrity program management requirements effective starting in 2004
      - ✓ Natural gas lines in HCAs are subject to integrity management program requirements



# Pipeline Risk Analysis – Model Logic



- ✓ Risk model logic must conform to defined industry standards
  - API RP 1173 – Pipeline Safety Management Systems
    - ASME B31.8S – Managing System Integrity of Natural Gas Pipelines, section 5
    - API 1160 – Managing System Integrity for Hazardous Liquids Pipelines, section 7
- ✓ Relative and Quantitative
  - Relative – Index Based
  - Quantitative - \$\$/mi Based

# Pipeline Risk Analysis – Model Logic



## ✓ POF – Probability of Failure

- Time Dependent
- Time Independent

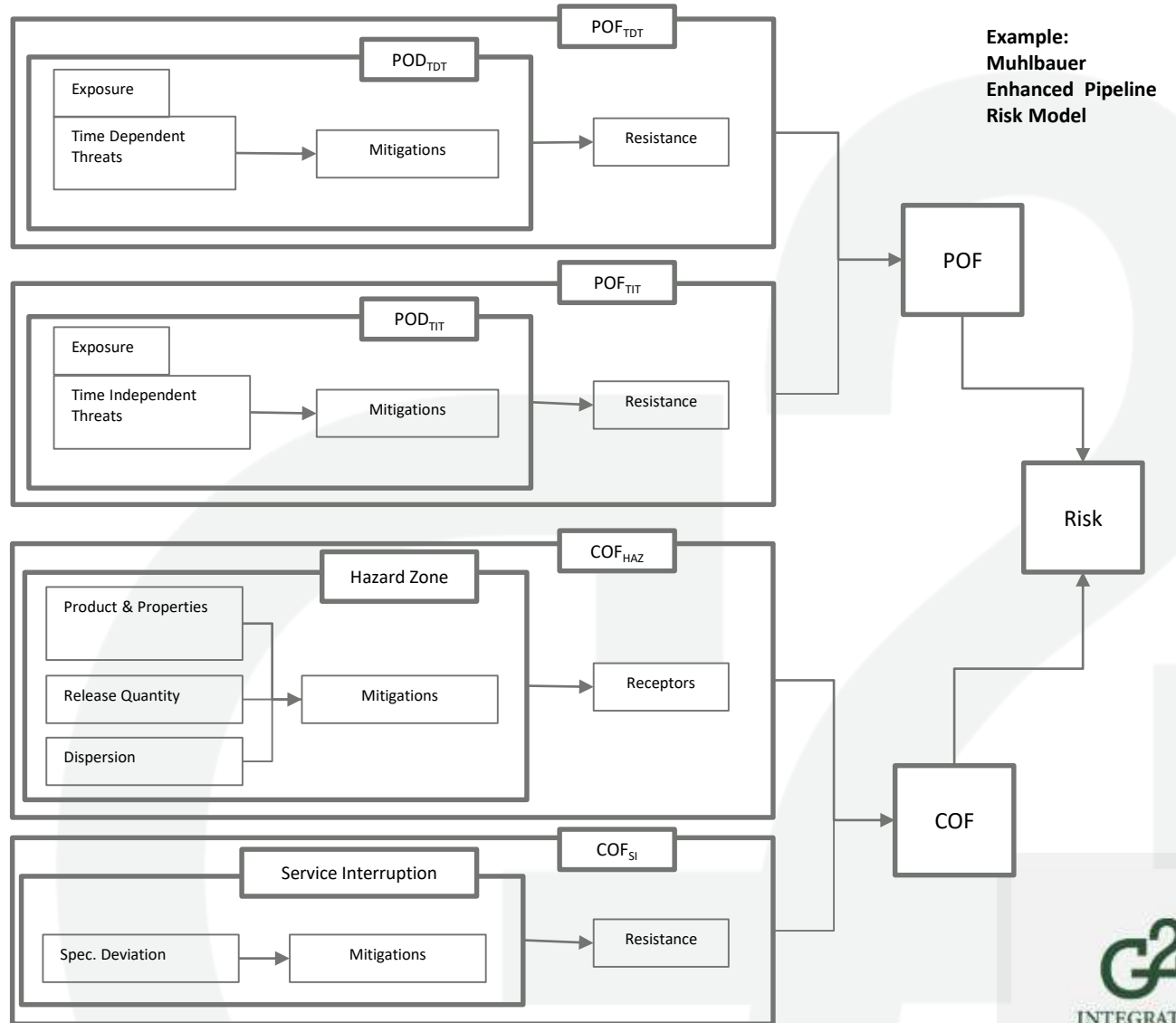


## ✓ COF – Consequence of Failure

- Sensitive Receptors (HCA)



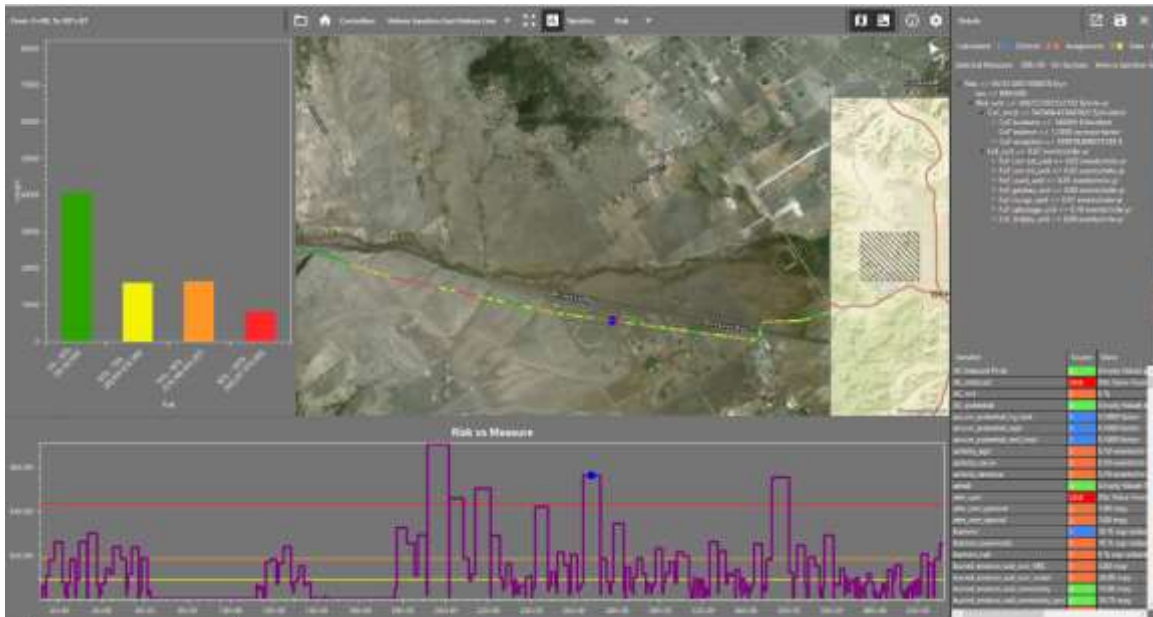
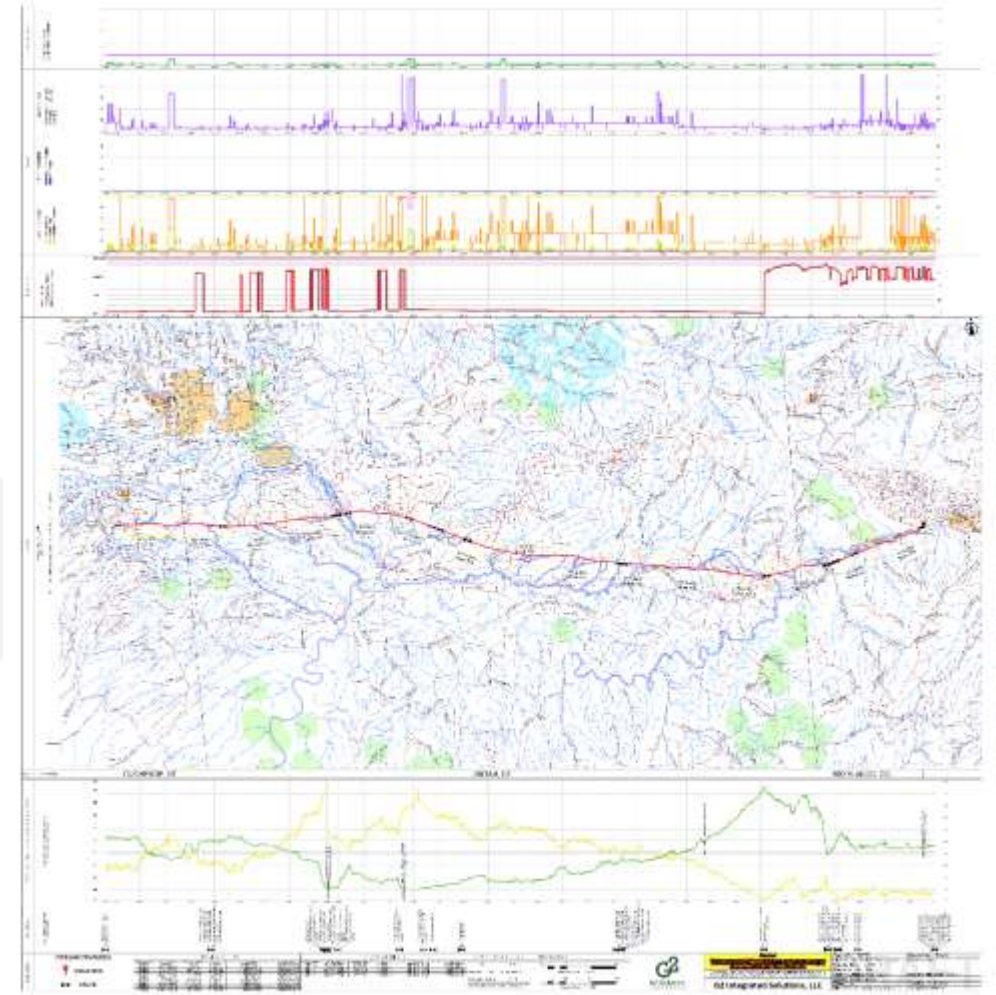
## ✓ POF → FOF for our model



# Traditional Risk Results Review Tools



- ✓ Risk alignment sheets
  - Static documents
  - Inflexible
- ✓ Fit-for-purpose risk data viewers
  - Don't typically allow ad-hoc geospatial views



# Insights for ArcGIS in ArcGIS Online



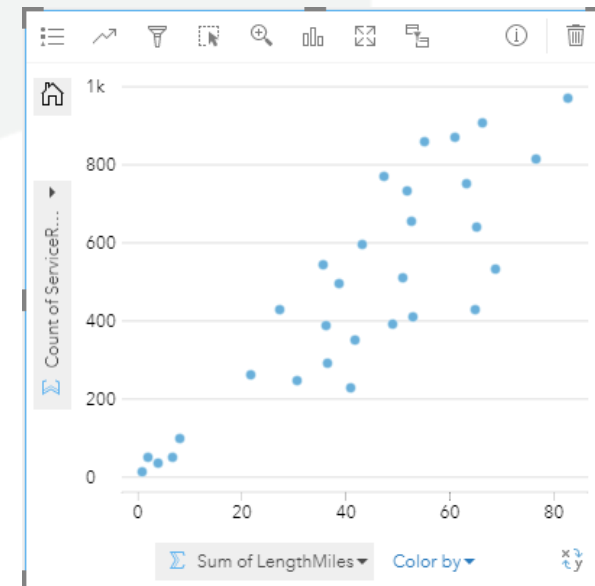
✓ Insights was released on ArcGIS Online in December, 2017

- Low-cost, readily accessible data hosting environment
- Does not require full Esri on-premises platform
- Next generation web graphics
  - Quick performance with large datasets



✓ The 2.0 Insights release also included a new graph type critical to risk data analysis

- Scatter plot
  - Useful for “profile” displays







## ✓ Data Source Compatibility

- Hosted feature layers from your organization
- Databases (MSSQL, Oracle, etc)
- Excel workbooks
- CSV
- Living Atlas



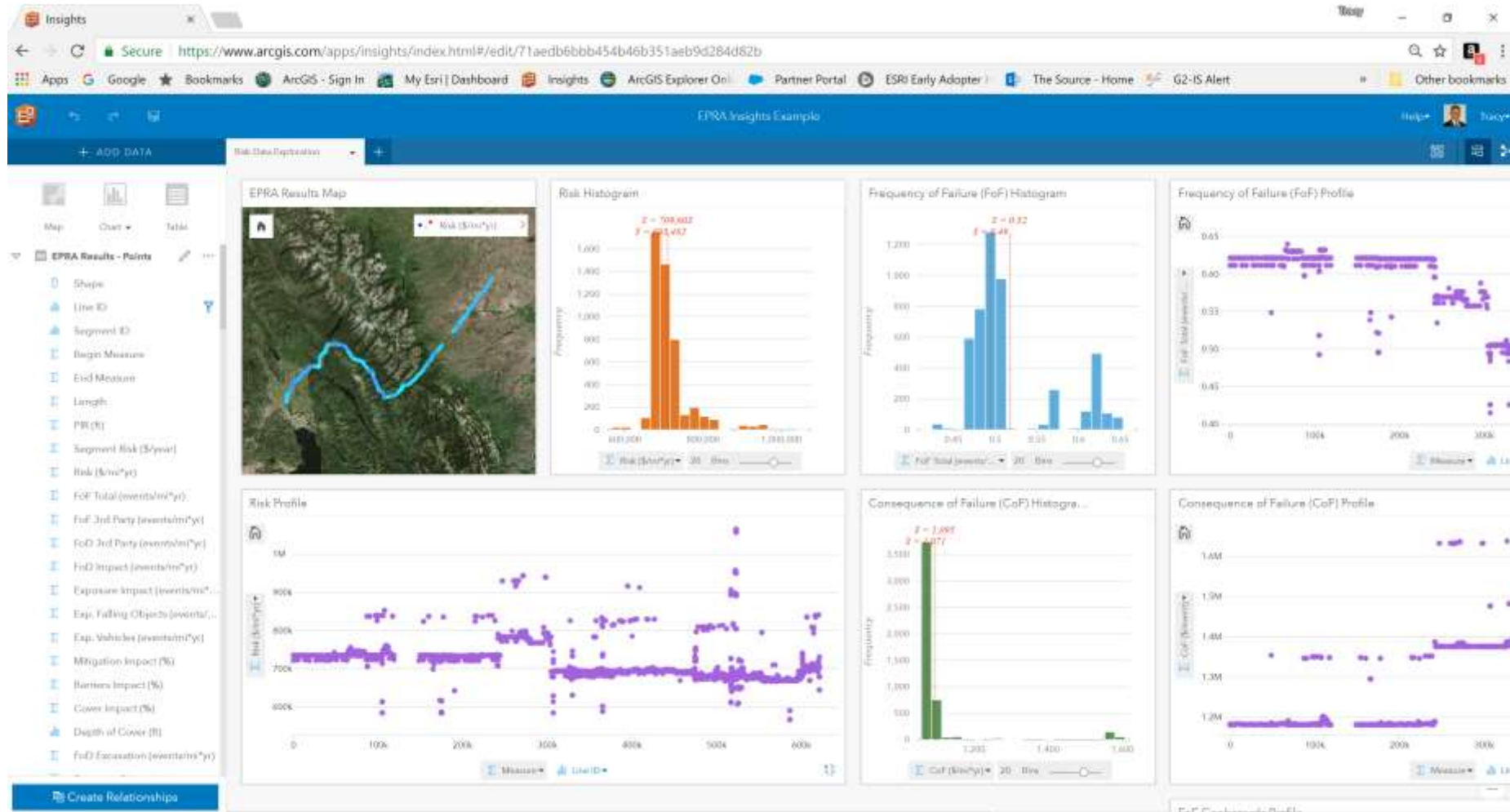
# Publishing to ArcGIS Online



- ✓ Start with dynamically segmented risk results
  - Route identifier, from- and to- measure/station values on each row in the output
  - Relational database table, Microsoft Access or Excel are typical raw sources
- ✓ Create an ArcMap route event layer (features) and export to a geodatabase
- ✓ Publish to ArcGIS Online as a hosted feature layer
  - Feature access enabled
- ✓ Consume in Insights
  - Insights is a premium app and requires separate licensing beyond AGOL level 2 named users



# Insights Demonstration





- ✓ Insights is a good tool for exploring large, complex datasets
  - High performing
  - Flexible
  - Convenient
  - Enables non-traditional GIS users
- ✓ Still needs improvement
  - Enhancements to scatter plots
    - Multiple scatter plot variables sharing a common X-axis
  - Performance
  - License integration with named user accounts

# QUESTIONS

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